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ARTICLE I.

## A CASE OF SUPPOSED DISLOCATION OF THE TENDON OF THE LONG HEAD OF THE BICEPS MUSCLE.[1]

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BEFORE proceeding to a description of the case which, by reason of its apparent rarity, it has seemed worth while to bring to the attention of the profession, it may be profitable, possibly not uninteresting, to review the history of the few other cases in which this same accident, luxation of the tendon of the long head of the biceps muscle, was supposed to have occurred.

The earliest mention of it in surgical literature seems to have been made in the first quarter of the last century, or thereabouts.

In the edition of the *Myotomia Reformata* of William Cowper, published thirteen years after his death by Richard Mead, at London, in 1724, appears the following description:—[2]

"An extraordinary Case, relating to this Muscle, has more than once happened in our Practice. Particularly a Woman, three days before she consulted us, had (as she suspected) dislocated her Shoulder-Bone, by wringing of Linen Clothes after washing (which is commonly done, to express the Water), adding that, in straining her arms in that Action, she sensibly felt something (as she thought) slip out of its place on her Shoulder. After examining the Part, we were well satisfied that there was no Dislocation; but observing a Depressure on the external part of the Deltoid Muscle, and finding the two inferior Tendons of this Bicipital Muscle rigid, and the *Cubit* thereby denied its due Extension, we sus-

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[1] Read before the Philadelphia Academy of Surgery, Dec. 3, 1883.

[2] An Anatomical Treatise on the Muscles of the Human Body. Illustrated with Figures after the Life. By the late Mr. William Cowper (p. 75).

pected that the external tendinous Beginning (before taken notice of) was slipped out of its Chanel on the head of the *Os Humeri;* but finding the part at that time somewhat inflamed, we advised her to an emollient Application, and to give her Arm rest till the next day, at which time we found our Conjecture true; for by turning the whole arm to and fro, the Tendon readily slipped into its place, she recovering the use of the Part immediately."

Monteggia[2] (*Institutione Chirurgiche*, t. v. 179) describes the case

Of an aged woman, who fell, receiving a severe shock to the shoulder, followed by an acute pain which only ceased after she had felt "something" which was displaced return to its proper position. Afterwards she had a recurrence of this symptom from very trivial causes. Each time that she felt anew the localized pain, she would rest the hand of that side upon the shoulder of another person, and with the arm in that position, she felt the tendon of the long head of the biceps return to its position, and the pain disappeared.

Mr. William Bromfeild, Surgeon to her Majesty's Household, and to St. George's Hospital, in his *Chirurgical Observations and Cases* (London, 1773), says (p. 76):—

"I dare say many surgeons have seen a lameness in the shoulder from almost a similar cause, that is, the tendon of the *biceps* muscle, which runs in the excavated groove in the head of the *os brachii*, having by some turn of the limb, slipped out of the *sulcus*, and resting on one of the little exuberances of the upper part of the channel, till it returned, has occasioned, not only an immobility of the joint, but most violent pains. When the case is known, the reduction is very easy, for the cubit being bent the muscle is relaxed, and while an assistant holding the lower extremity of the *os brachii*, moves the head thereof, sometimes inward, sometimes outward in the *acetabulum scapulæ;* the operator with his fingers will easily replace it, and the patient presently becomes perfectly easy."

In the one hundred years which have elapsed since worthy Mr. Bromfeild thus confidently expressed his views upon this subject, but very few if any cases have been reported, which on examination seem to belong beyond question to the class of injuries which he here describes.

The case of Mr. John Soden, of Bath, communicated to the Royal Medical and Chirurgical Society of London, July 6, 1841, by Richard Partridge, Esq., is the one which has excited most comment, as the symp-

[1] Mangetus, who died in 1742, at the advanced age of ninety, in his *Theatrum Anatomicum*, published at Geneva in 1717 (subsequent to the first edition of Mr. Cowper's treatise on the muscles), quotes the above case (pp. 39 and 40), together with some remarks on the "two inferior tendons" of the biceps, and on their relation to the operation of phlebotomy, all of which he translates, without the alteration of a word, into the scholarly Latin in which his work is written. He gives Mr. Cowper full credit, as is apparent from his opening sentence (see foot-note to page 53), in which he speaks of him as "Accuratissimus Anatomicus," etc.

Mr. Henry Hancock (*Provincial Medical and Surgical Journal*, 1844, vol. viii. p. 507), quoting the case of Mangetus (whom he calls Magnetus) from the *Encyclopædie Méthodique*, and that of Cowper from an edition published in 1737 by Albinus, at Leyden, very unjustly observes that these "two cases," as he calls them, so closely resemble each other that there can be little if any doubt that the one is an unacknowledged and pirated version of the other; and as Cowper is known to have appropriated Bidloo's anatomical plates, he suggests that he would not hesitate long in appropriating another man's case. An excellent illustration of the danger of quoting at second-hand!

[2] Quoted by Jarjavay, *Gazette Hebdomadaire*, May 24, 1867, p. 325.

toms during life were in this instance supposed to be explained by the result of the autopsy:—

A man aged 59, while falling backwards, placed his arm behind him and received the whole weight of his body on the right elbow. Acute pain in the shoulder was immediately experienced, and the man supposed that he had suffered either a fracture or dislocation, but, finding that he could raise the arm over his head, he felt reassured.

The next morning the joint was greatly swollen, tender to the touch, and painful on very slight motion. A severe sprain was diagnosed and antiphlogistic measures adopted, but at the end of three weeks the tenderness in front of the joint and pain on certain movements of the limb were scarcely less than on the day after the occurrence of the accident. Another careful examination was then made. On comparing the joint with its fellow, now that the swelling had subsided, a marked difference was observable between their respective outlines. The injured joint was manifestly out of drawing, without presenting any glaring deformity. When the man stood erect, with his arms dependent, the distinction was very manifest, but difficult to define. There was a slight flattening on the outer and posterior part of the joint, and the head of the bone looked as though it were drawn up higher in the glenoid cavity than it should be. Examination verified this appearance in two ways: 1st. On moving the limb, with one hand placed on the shoulder, a crepitating sensation was experienced under the fingers, simulating a fracture, but in reality, caused by the friction of the head of the humerus against the acromion. 2d. On attempting abduction, you found that the arm could not be raised beyond a very acute angle with the body, from the upper edge of the great tubercle coming in contact with the tip of the acromion. The head of the bone was unduly prominent in front, almost to the amount of a partial dislocation.

For all useful purposes the arm was powerless. The smallest weights could not be raised on account of the severe pain induced by any exercise of the biceps, which was described as very acute and extending through the whole course of the muscle, but felt chiefly at its extremities, the lower with the upper. When not excited by muscular action it was referred to the front of the joint and confined to the space between the coracoid process and the head of the humerus, which was marked by some puffy swelling. The patient being of a rheumatic habit, inflammatory action of that character was soon established in the joint, so that the peculiar symptoms of the injury were masked by those of general articular inflammation, which added greatly to the man's suffering and to the difficulty of diagnosis.

The patient found most relief from the elbow being well supported and placed close to the side, with pressure by a soft pad firmly applied against the deltoid muscle.

All this occurred in the month of May, 1839. In November of the same year the patient died of compound fracture of the skull, and an opportunity for an autopsy was afforded.

On examining the joint the accident was found to be a dislocation of the long head of the biceps from its groove, unaccompanied by any other injury (Fig. 1). The tendon was entire and lying inclosed in its sheath on the lesser tubercle of the humerus; the capsule was but slightly ruptured; the joint exhibited extensive traces of inflammation; the synovial membrane was vascular and coated with lymph; recent adhesions were stretched between different parts of its surface, and ulceration had commenced on the carti-

Fig. 1.

lage covering the humerus where it came in contact with the under surface of the acromion; the capsule was thickened and adherent, and in time probably anchylosis of the joint would have taken place.

In his remarks on this interesting case, Mr. Soden endeavours to explain the phenomena by attributing to the long head of the biceps the function of a capsular muscle. He remarks that the altered position of the bone must have been dependent on the displacement of the tendon, as the injury was uncomplicated; and continues: The head of the humerus is said to owe the security of its position rather to the combined action of the capsular muscles than to the ligamentous attachments of the humerus to the scapula; and the tendon is vaguely described as strengthening the joint, and in that respect having an analogy to the ligamentum teres of the femur. The capsular muscles may be considered as having their origin from the upper three-fourths of the circumference of a circle; they then converge towards its centre, represented by the head of the humerus, into the upper, anterior, and posterior parts of which they are inserted. In the lower segment of this circle there is a gap (the axilla) not occupied by muscles. As the head of the bone rolls on an almost flat surface, its position is entirely under the control of the capsular muscles; it follows, therefore, that to enable the bone to maintain its equilibrium these muscles should exactly antagonize each other or the head of the humerus would be drawn to the side of the preponderating muscle. The necessity of a muscle from the ribs to the humerus, to counteract the upper capsular muscles, is probably superseded by the singular course of the long head of the biceps. We can thus understand why, when the tendon is ruptured or displaced, the head of the bone should rise upwards and forwards —a precisely opposite direction to that in which the tendon would, when *in situ*, tend to direct it.

This case and Mr. Soden's remarks have been quoted by almost every writer on the subject since their publication. Bransby Cooper, in his edition of Sir Astley Cooper's Treatise on Fractures and Dislocations of the Joints (London, 1842), quotes it almost in full with seeming approval under the head of "Partial Dislocation upwards of the Shoulder-joint."[1] Mr. Pirrie under the same caption gives in his treatise on surgery an abstract of the case. He adds that in the museum of the Medico-Chirurgical Society of Aberdeen there is a preparation of an unreduced dislocation upwards which in all respects very closely agrees with the description and figure of Mr. Soden's case. The criticisms of other writers in this case will be given presently.[2]

[1] See Agnew, vol. ii. pp. 55–56, on those cases of so-called partial dislocation forwards and upwards, which he believes to be impossible, without fracture of the coracoid process.

[2] The second case of Mr. Soden was one of forward dislocation of the humerus attended with great difficulty in reduction. The patient died in a few days from internal injuries received at the time of the accident, and the autopsy disclosed the fact that

Dr. James S. Green reports a case (*Virginia Medical Monthly*, vol. iv. p. 106) of supposed luxation of the tendon occurring during muscular action. It was thought that in this case the tendon was preternaturally mobile (see *supra*, case of Monteggia), at least after the first of a series of accidents which took place as follows:—

In November, the patient, a large corpulent woman, aged 52 years, fell on a slippery step, injuring her shoulder. She was taken home in a carriage, on getting out of which she fell again and felt something—"the bone"— return to its place, upon which she was relieved. Ten weeks later, while attempting to drive a bird into its cage, striking at it over head with a newspaper, she was seized with violent pain in the same shoulder, and the arm fell to her side. The next day she had the following symptoms: Exquisite tenderness on the anterior and inner surface of the shoulder, over a space about a finger's width and finger's length in extent; abduction of the arm gave great pain; movement of the arm backward, either passively or by means of the latissimus dorsi, gave rise to the same pain which extended along the tract of the musculo-cutaneous nerve. This pain was constantly present as far as the external condyle of the humerus. Active flexion of the forearm upon the arm, to less than a right angle, gave most acute pain at the shoulder.

There were no symptoms of fracture or of scapulo-humeral displacement.

Partial relief from pain was obtained by keeping the arm close to the body and elevating it by a sling and bandage.

Ten days later, in an effort to save herself from another fall, she suddenly threw the injured arm upward and backward, when she "felt something return to its place with a snap," accompanied by agonizing pain. After this the symptoms all gradually disappeared.

From the study of the mode by which this spontaneous reduction took place, and of the symptoms of the case, Dr. Green recommends in the treatment of such cases, flexion of forearm, rotation of the hand outward, and the use of a sling.

Mr. G. W. Callender, in an article on Dislocations of Muscles and their Treatment (*The British Medical Journal*, July 13, 1878), wrote:—

"Perhaps of all tendons, those which have been most under notice are the biceps of the arm, and the conjoined tendon, which, through the patella, comes occasionally to be dislocated from the front surface of the femur. There is Dr. Hamilton's case of supposed dislocation of the biceps tendon; and in our London museums there are specimens showing displacement of the tendon of this muscle. It is not long since a woman was under our notice in Sitwell ward, who suffered from a hurt of this nature. I am very sorry we could do but little for her; but we did not see her until long after the first occurrence of her trouble. This woman had great pain with her hurt. The shoulder seemed to droop forward, and she shrank from using the biceps, and, indeed, from moving the joint. The tendon lay on the inner side of its groove, and by pressing against it so as to push it outwards, and by rotating the arm inwards, it would slip back into the groove, but only to slip out again, when the pain, which had been for the time relieved, was again felt. Of course continued rest was tried in the hope that the tendon would be resheathed in its groove, but it was not so; and the conclusion we came to was that the groove had become in part filled up, probably, by fibrous tissue;

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the tendon had escaped and had slipped completely over the head of the bone, lying at the inner and posterior part of the joint.

No symptoms are mentioned except that the dislocation was "very high up." The difficulty in reduction was attributed to the complication of the injury to the biceps. "The inferences from the former case would lead us to expect that, had the tendon been *in situ*, it would have aided in the return of the bone; but its influence being removed the influence of the upper capsular muscles became doubled, and twice the amount of force was consequently required to overcome it."

or that the tendon could not lie and act in it without some binding down by a sheath; and as such ensheathing did not follow the reduction, the leader worked out so soon as any strain was brought to bear on it."

Laugier, Chirurgien de l'Hôpital Necker, has recorded (*Archives Générales de Médecine*, 2d series, vol. v. pp. 65, 66, 67) a case of "incomplete luxation of the head of the humerus upwards and forwards behind the coracoid apophysis,

In which, some days after an accident which was at first taken for a sprain of the shoulder, he found a slight depression beneath the acromion, a prominence of the head of the bone anteriorly, a shortening of the arm to the extent of five or six lines, and a difficulty in abduction of the humerus, the movement being accompanied by an equal movement of the scapula. There had been at no time the signs of a fracture or dislocation. Attempts at reduction were made, but were unsuccessful."

Mr. Alfred Mercer (*Buffalo Med. and Surg. Journal*, vol. xiv. p. 641) relates the following case:—

"Mrs. B., a well-developed woman, of full habit, aged fifty-six, seven years since was thrown from a carriage, dislocating her right shoulder, which was reduced a short time after the accident, but the shoulder was painful, and tender to the touch, and almost useless for months after. She could carry the arm forwards and backwards, but could not raise it from the side, or carry the hand behind her, or raise it to her head for fourteen months. She has gradually gained better use of her arm, but now, July, 1858, she cannot raise her elbow from the side more than half-way to a horizontal position without assistance; but with assistance the arm may be carried into any position without pain or resistance. Measurement shows no appreciable difference in the size or length of the arm or size of the shoulder; but the point of the shoulder is still tender to the touch, is prominent in front, and correspondingly flattened behind. The head of the humerus appears to rest against the outside of the coracoid process, but the fulness of habit obscures the diagnosis compared with the other cases. Several doctors at different times have examined the shoulder; some have said it was not properly reduced, and advised a suit for malpractice.

"I examined the shoulder again in November last; it presented the same general appearance, although the patient was much thinner in flesh, from recent sickness. Some six weeks previous to this examination, in a sudden and thoughtless effort to raise the arm above the head, the muscles unexpectedly obeyed the will; since which time she has had perfect use of it, though the deformity still remains. She thinks she felt or heard a snap when the arm went up, but it was followed by no pain, soreness, or swelling."

There can be no doubt, we think, adds Dr. F. H. Hamilton, that in this case, at least, the deformity and maiming were due, in a great measure, to a displacement of the long head of the biceps.

Mr. Henry Hancock, Surgeon to Charing Cross Hospital, wrote as follows (*loc. cit.*) in reference to this dislocation, but describes no particular case:—

"The principal signs of this accident are pain and tenderness in front of the joint, corresponding to the bicipital groove; acute pain in the course of the biceps, when it is thrown into action, the pain being referred more particularly to its two extremities; the patient is unable to raise his hand to his head, or his arm beyond an acute angle from his body; the appearance of the shoulder is somewhat altered, the head of the humerus being drawn upwards, and more forward than natural, lying close beneath the acromion process, while the posterior and external part of the joint is somewhat flattened. When we consider how much

in appearance these accidents resemble partial dislocations of the humerus upward and forward, we can entertain but little doubt that they have frequently been mistaken for them." "I am not aware of any particular symptom by which we can be guided with any certainty as to when the tendon is dislocated inward, or when outward; but, as a result of my experiments, I should imagine that it is more frequently dislocated inward than outward, the inclination of the head of the humerus, and the greater projection of the large tubercle being unfavourable to the latter displacement."

These clinical cases were long ago supplemented, and were supposed to be confirmed by the reports of dissections in which dislocation of the tendon of the biceps was found associated with other pathological conditions of the shoulder-joint. For example, in the *Medical Gazette* for May 24, 1835, Mr. John Gregory Smith reported seven cases of injury of the shoulder-joint as observed in the dissecting-room. The pathological changes which have any bearing on the present paper, may be enumerated as follows, it being understood, of course, that no clinical histories were obtainable:—

CASE I. The bursa beneath the deltoid was much enlarged and thickened, and communicated with the general cavity of the joint by a large, irregular opening. The tendons of the scapular muscles were completely detached from the greater and lesser tuberosities. The tendon of the long head of the biceps had been torn away from the upper part of the glenoid cavity, and entirely withdrawn from the joint; it was found to be firmly attached to the anterior margin of the bicipital groove. The head of the humerus moved freely in all directions on the glenoid surface of the scapula.

CASE II. Sub-deltoid bursa as above; tendon of subscapularis detached; tendon of long head of biceps ruptured; attached to margin of bicipital groove.

CASE III. Tendons completely torn from greater tuberosity; that of subscapularis partially detached; tendon of long head of biceps torn; attached to bicipital groove.

CASE IV. Bursa beneath deltoid as above; tendons of subscapularis and supra-spinatus detached: tendon of long head of biceps torn from the upper part of the glenoid cavity; attached to bicipital groove; the portion of the belly of the biceps pertaining to the long head was remarkably short, the short head being unusually developed.

CASE V. Sub-deltoid bursa as above; partial separation and detachment of the supra-spinatus and subscapularis muscles from the larger and lesser tubercles; tendon of the biceps torn.

CASE VI. Bursa as above; tendon of subscapularis and supra-spinatus detached; fibres of infra-spinatus and teres minor appear to have suffered severe tension; tendon of the long head of the biceps displaced from its groove, but not separated from its origin; it lay loose in the inner part of the cavity of the joint; the capsular ligament had been much stretched and readily allowed the head of the humerus to be displaced so as to rest upon the inner margin of the glenoid cavity.

CASE VII. Bursa very large, parietes thickened, separated from cavity of joint by a thick layer of lymph. Head of bone freely movable, and easily drawn to inferior margin of glenoid cavity; tendon of subscapularis detached; tendons of supra- and infra-spinatus attached, but the fibres of these muscles had evidently been much stretched; tendon of the long head of the biceps permanently displaced from the bicipital groove, and lying at the inner and lower part of the joint, playing over a smooth part of the lesser tubercle.[1]

[1] Cases VI. and VII. represent the two shoulder-joints of one individual, as did also Cases IV. and V.

Mr. Edward Stanley, in the *London Medical Gazette* for 1829 (vol. iii. p. 12), wrote:—

"In two instances I have found, upon dissection, the tendon of the biceps separated from the edge of the glenoid cavity, and firmly adherent to the margin of the bicipital groove; *but there was no other unusual appearance of the parts, either in or about the joint.* In a third instance, I found the tendon of the biceps dislocated from its groove, and resting upon the great tuberosity of the humerus. A membranous sheath attached to the humerus, and extending around the tendon, confined it in its new situation. This sheath was polished on its internal surface, it seemed for the purpose of facilitating the play of the tendon, and its formation may be presumed to have been analogous to that of the capsule inclosing the ends of a fractured bone"

These cases will suffice as examples of this sort of evidence, that obtained at autopsies and unassociated with clinical histories. They, as well as their predecessors, have met with scant mercy at the hand of their critics.

Pouteau, who believed that he had established the occasional dislocation of muscles from their aponeurotic sheaths, asks himself (*Mélanges de Chirurgie*, p. 433) if it is possible for tendons to become thus displaced, and, after some expression of doubt, declares that he is forced to the conclusion that, during the energetic contraction of muscles, the tendons themselves would break rather than their sheaths.

Mons. J. F. Jarjavay, Professeur à la Faculté de Médecine, chirurgien de l'hôpital Beaujon, etc., published in 1867 (*Gazette Hebdomadaire*, Nos. 21 and 23) a paper on this subject. After alluding to the cases of Bromfeild, Cowper, Monteggia, Stanley, Smith, and Soden, he sums up, not altogether correctly, the symptoms observed by the first three of them as follows:—

An acute pain in the point of the shoulder during a violent twist of the arm; a sensation of displacement in that region, giving rise to the belief on the part of the patient that a luxation of the humerus has occurred; a greater or less difficulty in the movements of the scapulo-humeral articulation; a variable degree of inflammation; a well-pronounced bruit heard on moving the arm; rigidity of the biceps with flexion of the elbow; a sensation of reduction following movements of rotation imparted to the head of the humerus. This group of symptoms, he says, has led the authors in question to diagnose a luxation of the biceps tendon, but he considers the proof of such a lesion to be entirely wanting. He adds that there is no doubt, however, that patients present themselves after violent strains of the shoulder, with acute pain and immobility of the joint, with a sensation of fatigue about the lower portion of the biceps, with a feeling of something displaced, and with a marked bruit produced by rotating the arm, but that these phenomena are due to a lesion altogether different from luxation of the tendon. In proof of this he reports five cases of injury of the shoulder which may be summarized as follows:—

CASE I. A man, aged 25 years, in order to carry a heavy bag of sand on his left shoulder, steadied it with his right hand passed behind and above his head. While he was raising it into this position he felt a sudden pain at the point of the shoulder, and the arm became powerless and fell suddenly by the side of the trunk. Three days later he presented the following symptoms: Slight swelling of the right shoulder; forearm flexed on arm; immobility produced by the pain of movement; pain over lower portion of the biceps on which the skin above the elbow is tense; pain in extending the forearm. He could carry the arm feebly forward, backward, and inward, but abduction to a slight extent caused severe pain. Rotation of the humerus with the arm at the side was noiseless, with the arm abducted until it was horizontal was associated with a species of *claquement*, which could be plainly heard by the surgeon and his assistants. If

the arm were then abandoned it would fall to the side with a sudden pain and noise resembling the reduction of a luxation. The same phenomena could be reproduced repeatedly. If, during the rotation of the humerus held horizontally, an assistant pressed downwards its upper extremity, the noise ceased.

All these symptoms greatly diminished in a few days under the use of cold lotion and a sling. Nine days after the accident the sling was discarded and movements of the arm were good.

CASE II. A man, 56 years of age, while drawing powerfully on a corkscrew, had an acute pain in the shoulder. Eight days afterwards, when he was first seen, he had painful abduction, creaking on rotation, etc. (as in Case I.), flexion of the forearm, etc. No swelling or tenderness. Nearly well in three days.

CASE III. A woman, 47 years of age, fell and twisted her right arm, producing a sharp pain in the shoulder. The symptoms were the same as the above. No pain except during abduction, when it was acute and associated with the creaking noise. She returned to her work quite well in three days.

CASE IV. A man, 28 years of age, fell on his right hand, wrenching his shoulder. The same symptoms followed—moderate swelling of the shoulder, but no deformity and no ecchymosis. Four days later all the swelling had disappeared and much of the pain. In three weeks he was entirely cured.

CASE V. A man, 27 years of age, and entirely without any history of traumatism, presented himself with a swollen reddened shoulder, with painful rotation of humerus, a slight creaking, etc. A puncture beneath the tip of the acromion was followed by the escape of about two teaspoonfuls of clear serum. This was repeated two or three times—other treatment was applied, and the patient was almost well in six weeks.

These cases have the following characteristics which distinguish them, according to M. Jarjavay, from other injuries about the shoulder, and which establish the fact that they were not due to a luxation of the bicipital tendon. 1. They were all produced—except Case V.—by a twist of the arm. 2. The seat of the pain (as in the cases of Cowper, Bromfeild, and Monteggia) was at the external aspect of the point of the shoulder, on a line with the tip of the acromion. 3. The long tendon of the biceps is at least two and a half centimetres within this point. 4. The pain and the noise are synchronous, and are manifested only at the moment when the arm is carried into abduction, and is sufficiently elevated for the great tuberosity to glide under the tip of the acromion, or is rotated, while in that position. 5. Case V. shows that an acute hygroma of the sub-acromial bursa may produce all these symptoms. 6. If we examine this bursa we find that movements of tension distend or crumple up its walls; if the deltoid muscle is detached from its insertion and turned upwards over the acromion and clavicle, and the humerus is abducted, it will be seen that the walls of this bursa are folded upon themselves, and form a pad or cushion beneath the tip of the acromion, and that at the moment the humerus reaches the horizontal, the tuberosity glides under the acromion, pushing these folds of the bursa before it.

Bearing these clinical and anatomical facts in mind, M. Jarjavay comes to the following conclusions, which refer to his own cases and to those of Cowper, Bromfeild, and Monteggia.[1]

[1] Those of Stanley and Gregory Smith observed post mortem only, he attributes to previous luxation. As to that of Soden he agrees entirely with Malgaigne, whom he quotes.

1. Simple luxation of the long tendon of the biceps muscle does not exist, or at least has never been demonstrated.

2. The lesion which has been considered to be a luxation of this tendon, has its seat in the sub-acromial serous sac.

3. This lesion is an inflammatory enlargement, caused by contusion or laceration of this sac, or by hypertrophy, with induration of its walls and fibrous transformation of its cellular partitions, consecutive to inflammation.

4. Its symptoms are the following: Sensation of displacement at the time of the accident; swelling of the shoulder; pain preventing movements of the arm, principally those of abduction; forearm flexed upon the arm, and consequent rigidity of the biceps muscle and a feeling of uneasiness in the front of the elbow; increase of pain, and bruit below the acromion when the arm is raised and abducted, and the greater tuberosity is made to glide under this apophysis (the bruit is a crackling sound, and gives the sensation of a reduction of something displaced; it is reproduced whenever the bone maintained in a horizontal position is rotated); relief of pain, and restoration of the movements of the arm after rest; habitual persistence of the crackling bruit, even when the pain is no longer felt, and the movements are free.

Malgaigne (*Traité des Fractures et des Luxations*, Paris, 1855, t. ii. pp. 565–66–67) makes the following criticism upon Mr. Soden's cases, prefacing it with a few remarks upon the so-called upward luxation, which are so pertinent to the case I am about to describe, that I translate them also:—

It is not rare to observe in *scapulalgies*, which have become chronic, a *subluxation upward and forward*, which has acquired a certain importance on account of the mistakes to which it has given rise. I have shown many examples of it at my clinics. The humeral head is elevated until it is almost in contact with the acromion, and is carried forward against the external border of the coracoid process; there is found, in consequence, a slight depression under the acromion, shortening of the arm and limitation of its movements. It is really this condition, unless I am mistaken, which M. Laugier has described as an incomplete upwards and forwards luxation, produced by traumatism. (See p. 22.) His patient, after a twist of the shoulder, had pain and swelling. M. Laugier, after a careful examination, diagnosed at first only a sprain. At the end of twelve days, however, the swelling had largely disappeared, and he then perceived that the head of the bone was prominent at the front and inner side of the joint near the coracoid process, and was somewhat elevated, the arm being shortened five or six lines.[1] M. Avrard has observed a displacement of the same character, dating back thirty-one years, and following a fall upon the shoulder. The head occupied the space included between the coracoid, the acromion, and the glenoid cavity, into which it could not be brought again. The arm was shortened from eight to ten millimetres; abduction was arrested at 30° by the impinging of the great tuberosity upon the point of the acromion, and all the movements of the joint were greatly restricted.[2]

That which deceived these two observers was the traumatic cause of the affection; I have myself for a long time sought to explain their observations by a traumatic lesion. J. Soden, in England, having been able to study an analogous case with the scalpel, came to the conclusion that it was a luxation of the long tendon of the biceps. His patient, after a fall on the elbow, felt a sharp pain in the shoulder, and fearing a fracture or a luxation, was only reassured by finding that he could raise the arm above his head. The next day the shoulder was swollen, and elevation of the arm had become impossible. Soden was called in, found no displacement, and treated the case as a sprain. Finally, at the end of three weeks, the swelling having subsided, it was found that the head of the humerus was unnaturally prominent in front and above. There was still pain in the joint, and elevation of the arm appeared to be prevented by contact between

[1] Arch. Gén. de Méd., 1834, t. v. p. 65.

[2] Revue Méd.-Chir., 1878, t. iv. p. 282.

the great tuberosity and the acromion. Five months later the patient died of a head injury. *The joint showed numerous traces of inflammation, the synovial membrane was unduly vascular and covered with lymph; there were recent adhesions between different points of its surface; the cartilage of the humeral head, where it was in contact with the lower surface of the acromion, was ulcerated; the capsule was thickened and adherent.*[1] Finally, the tendon of the biceps was displaced from its groove *without other lesion.*

A figure accompanying this description (see Fig. 1) seems to complete it. The head is actually elevated in the glenoid cavity; at the inferior portion of which a little space is left empty. The tendon occupying the greater part of its sheath, has simply dilated it above, in such a manner as to deviate a little in the direction of the lesser tuberosity. A deviation to that extent is not necessarily traumatic; and besides it would not explain the ascension of the humerus, which can readily be accounted for by the pathological retraction of the ligaments. On the other hand, this ascension might well have been the determining cause of the deviation of the tendon, forced to slip forwards in order to reach its glenoidal insertion by the shortest path. I have seen and shown at my clinic, many cases of the same character, and have come to a definite conclusion in reference to them. There has never been a traumatic luxation of the tendon of the biceps, otherwise than as a complication of a fracture or luxation; there cannot be a traumatic luxation which holds the head at the external side of the coracoid process; but there is a pathological sub-luxation of the humerus, due to articular inflammation and to retraction of ligaments, favoured, perhaps, by mal-position, or improperly applied dressings.

The criticisms of Mr. Robert Adams on the case of Mr. Soden, in his article on Abnormal Conditions of the Shoulder-Joint (*Cyclopædia of Anatomy and Physiology*, vol. iv. p. 595), seem to me worthy of great consideration. He had previously shown: 1. That one of the commonest conditions in chronic rheumatic arthritis of the shoulder-joint was atrophy or degeneration of the bicipital tendon which was often absent from the joint. 2. That in these cases the humerus has a very general tendency to pass upward towards the coraco-acromial vault, and that besides the removal of the biceps tendon the superior part of the capsular ligament is also observed to be deficient. 3. That these changes, as demonstrated in autopsies, frequently affect *both* shoulder-joints (see Cases VI. and VII. of Mr. Smith); but are described by writers, who (with the one exception of Mr. Soden), knew nothing of the clinical histories of their cases, as "rupture of the tendon of the biceps," an accident in the highest degree unlikely to occur symmetrically. 4. That so long as the long tendon of the biceps remains in its state of integrity, arching over the head of the bone, and then passing in a perpendicular line down along the humerus, the head of this bone cannot be partially elevated above its normal situation, nor even drawn inwards or backwards by either of the great muscles which form the anterior or posterior walls of the axilla; but that when the long tendon of the biceps is destroyed or dislocated, then the head of the humerus may be moved in whatever direction the inclination of the new plane formed by the altered surface of the glenoid cavity may give, or the muscles may draw it in. 5. He had given also the results of a post-mortem examination in a case of chronic rheumatic disease in a patient of Mr. Robert

[1] The Italics are Malgaigne's.

Smith, in which there was no history of accident. The head of the humerus was displaced upwards; the capsular ligament was deficient superiorly; the tendon of the biceps was perfect, but was thrown off the head of the bone inwards;[1] and, 6. Had given in addition the details of an autopsy in which almost the same displacement of the head of the humerus and tendon of the biceps, as in Mr. Soden's case, were found in *both* shoulder-joints, associated with the ordinary anatomical characters of chronic rheumatic arthritis.

Examining Mr. Soden's case in the light of these facts, it is important to observe: 1. That the patient was a man 59 years of age, "of a rheumatic habit," and that "inflammatory action of that character was soon established in the joint," etc. 2. That he at first supposed he had either a fracture or dislocation, but, finding that "he could raise the arm over his head," he felt reassured, and tried to resume his work. It would appear to us, says Mr. Adams, that if the tendon of the biceps were accidentally dislocated, the patient would not be able, immediately after the accident, to raise his arm over his head. 3. That the first symptoms were simply those of an inflammatory character, or, as Mr. Soden then supposed, of a severe sprain. 4. That the later symptoms; the flattening of the outer and posterior part of the joint; the elevation of the head of the bone; the crepitation, the pain along the biceps, the difficulty in abduction, the prominence of the head of the bone in front, all belong to an early stage of chronic rheumatic arthritis of the shoulder. 5. Dr. Macdowell (who examined the specimen for Mr. Adams) reported to him that "the head of the humerus is considerably enlarged, and that the long tendon of the biceps, which has been dislocated internally, is in a state of atrophy."

The criticism directed against the clinical aspects of these cases has been strongly reinforced by observations on disease of the shoulder-joint, particularly chronic rheumatic arthritis, which showed that many cases of dislocated tendon, discovered post mortem, and supposed to be the result of injury, were really due to disease.

Dr. Knox, of Edinburgh (quoted by Callaway), seems to have been the first person to notice a morbid condition of the tendon of the biceps. He found in the dissecting-room four cases in which the tendon had more or less disappeared, in one case altogether. In the others it was reduced to a few cellular and fibrous-looking threads, which could be traced with difficulty.

[1] "The great peculiarity in this case, Dr. Smith thought, consisted in the circumstance that the tendon of the biceps was not, as it usually is in cases of this chronic disease, absorbed, but was in a perfect state of integrity, as to structure. This tendon having been thrown off the head of the humerus and displaced inwardly, its normal function to restrain the ascent of the humerus through the medium of its muscular connection was as much annulled as if it had been removed altogether, as it usually is under the influence of this chronic disease."

Mr. Hargraves reported (*Edinburgh Journal*, 1837), a case of "partial dislocation" of the humerus in which the biceps tendon was ruptured. Sir Astley Cooper's case has already been referred to. In this the tendon was thought to have been ruptured, but to have again united. Mr. Callaway thinks (op. cit., p. 151), that he must have meant "united to the capsule of the joint."

Mr. Stanley (*Medical Gazette*, vol. iii. p. 12), says that in one instance he found the tendon of the biceps dislocated from its groove and resting on the great tuberosity of the humerus. A specimen (No. 55) in the museum of St. Bartholomew's Hospital is an example of dislocation (Callaway, op. cit., p. 145).[1]

Mr. Canton (*London Med. Gazette*, 1879, vol. viii., 3d series, p. 958) reports a case of chronic rheumatic arthritis of the right shoulder, in which the long tendon of the biceps was flattened and expanded, "permitting the head of the humerus to shift upward and thereby to articulate with the under surface of the acromion process."

Among the most important papers bearing upon this subject with which I am familiar, are those published by Dr. Robert W. Smith, Professor of Surgery in the University of Dublin (*The Dublin Quarterly Journal of Medical Sciences*, 1853, vol. xv. pp. 1, 343), under the title "Observations upon Chronic Rheumatic Arthritis of the Shoulder."

Having detailed the pathological appearances of this disease, and illustrated them by a case of his own, he proceeds to review the various cases which have from time to time been recorded in surgical literature as instances of rupture or dislocation of the biceps tendon, partial luxation of the humerus upwards, etc., beginning with Mr. John Gregory Smith's series of cases (see p. 23). He says:—

"It would be difficult to lay before the reader any more striking examples of the anatomical characters of chronic rheumatic arthritis of the shoulder than those furnished by the preceding group of cases, gratuitously described by the author (for their history was unknown) as instances of the effects of accidental violence. The absorption of a portion of the capsule; the detachment of the tendons of the capsular muscles from the tubercle of the humerus; the separation of the acromion into two portions; the ivory-like deposit upon the surface of the bones; the loss of the tendon of the biceps; its adhesions to the bicipital groove; *its displacement inwards from the summit of the humerus;* the osseous nodules about the tubercles; the conversion of these processes into articular surfaces; the enlargement of the capsule; the symmetrical development of the disease,[2] etc. etc., are elucidated in the clearest manner by this series of specimens."

[1] Mr. Stanley found that in a case which he supposed to be rupture of the biceps tendon, the slightest movement of the elbow backwards was followed by acute pain, precisely in the situation where the tendon of the biceps turns over the head of the humerus. There was also effusion of blood into the subcutaneous cellular tissue, but confined to the tract of the biceps tendon. In a similar case occurring in the practice of Mr. Normald it was observed that "the effort of bending the forearm was attended with a peculiar spasmodic and vibrating movement of that part of the biceps from which the long head is continued, and which was distinctly felt by the hand placed against the arm."

[2] Cases 4 and 5 occurred in the same person, as did also Cases 6 and 7.

Professor Fergusson's statement that partial luxation of the head of the humerus upward occurs pretty frequently, his opinion being grounded upon phenomena observed in the dissecting-room (see p. 34), he believes to be erroneous, and attributes it to the same cause: "In the remarks which he has made upon the subject, he has unknowingly described many of the leading features of chronic rheumatic arthritis of the shoulder, although he looks upon them as resulting from accident." Mr. Hilton's case[1] (*Guy's Hospital Reports*, vol. v.) and Mr. Alfred Smee's[2] (*The Lancet*, 1845, vol. i. p. 323) are interpreted by him in the same manner. He disposes similarly of the cases of Mr. Barron[3] (*London Med. Gazette*, vol. xx. p. 554), of Dr. Knox (*Ibid.*, vol. i.), of Mr. Stanley (*Ibid.*, vol. iii.), of Sandefort (*Museum Anatomicum*, vol. iv., tab. cli.), of Mr. Callaway (see p. 35), and of Sir Astley Cooper (see p. 20), all of which were reported as partial dislocation of the shoulder upwards, or as instances of rupture or dislocation of the bicipital tendon, and all of which, as he clearly shows, presented marked evidence of chronic arthritis. In none of them was there any satisfactory clinical history, the diagnosis having been founded, chiefly if not entirely, on post-mortem appearances.

Of Soden's case he says:—

"It has been clearly demonstrated that the fall alluded to in the history of the case had only this much to do with the partial displacement upwards of the head of the humerus which succeeded to it, that this accident became the starting-point of an inflammatory action of a rheumatic character, under the influence of which the head of the bone became elevated to the acromion process and the tendon of the biceps displaced."

He then describes the case of an elderly female, who had for many years suffered from chroic rheumatic arthritis of the right shoulder-joint, which, after death, was examined by him. The head of the humerus was displaced upwards, and the tendon of the biceps, perfect as to structure, crossed the inner instead of the upper surface of the head, the cartilage of which was abraded. The case of Charles Mailly, recorded by

[1] Dislocation downwards of the humerus into the axilla, associated with rupture of the tendon of the biceps.

[2] Dissection of a partial dislocation of the shoulder upwards. There was detachment of the biceps tendon from the edge of the glenoid cavity. Mr. Smee says: "Regarding the total alteration in the joint, arising from the injury, as a whole, we find that the shoulder-joint was converted into a double joint, one joint existing between the head of the bone and the glenoid cavity, the other between the great tuberosity and the under surface of the acromion." After study of the case he comes to the following conclusions: "First, that the tendon of the biceps is sufficient alone to keep the head of the bone from rising from its situation, or, at any rate, contributes principally to that object. Secondly, that the supra- and infra-spinati have no influence in drawing the head of the humerus under the acromion, as it was drawn into that situation when these muscles were divided."

[3] Detachment of the biceps tendon from the glenoid cavity. Mr. Barron and Mr. Pilcher met with this condition frequently in dissecting-rooms, especially in aged females.

Mr. Adams (see page 27), illustrates the same displacements of the head of the humerus and of the tendon, occurring in *both* shoulder-joints (as in Cases VI. and VII. of Mr. J. G. Smith's series).

He continues:—

"The remarkable elevation of the head of the humerus to which the name of 'partial luxation upwards' has been given has invariably been ascribed to the destruction or displacement of the tendon of the biceps, not only by those who look upon it as the result of external injury, but also by those who, in my opinion, correctly refer it to the effects of chronic rheumatic arthritis. Mr. Adams, for instance, observes that 'the effects of the loss of the tendon of the biceps are such that the head of the humerus is at once elevated by the deltoid and kept habitually pressed up against the under surface of the acromion.'[1] The correctness of this opinion certainly admits of being questioned, and I am inclined to believe that in the cases under consideration the cause has been mistaken for the effect. I do not mean to say that the accidental rupture or displacement of the biceps in a healthy shoulder-joint would *not* be followed by the elevation of the head of the humerus, but I suspect that in cases of partial luxation upwards resulting from the rheumatic disease in question the sequence of events is different from that observed by authors. I believe that in these cases the elevation of the head of the humerus occurs at a comparatively early period of the disease, and is a gradual process, and that the displacement is not in any instance sudden, as might be expected to happen were it consequent upon the rupture or dislocation of the tendon."

He believes the sequence of phenomena is as follows: Spastic contraction of the muscles under rheumatic irritation of the joint; elevation of the head of the bone; pressure against the tendon of the biceps; displacement inwards of the tendon which slips over the smooth globular head of the humerus until the tension is somewhat relieved; later should the tendon not atrophy under pressure the extra-capsular portion may become implicated, and will be found crossing the lesser tubercle.

Dr. Smith concludes his elaborate paper as follows:—

"A long and careful consideration of the subject discussed in the preceding pages leads me to believe that the occurrence of partial dislocation of the head of the humerus upwards, as an immediate result of rupture or displacement of the tendon of the biceps muscle from accidental violence, has not been anatomically demonstrated; that all the cases accompanied by dissections that have hitherto been published, as examples of the luxation in question, resulting from injuries to the tendon, have, in reality, been instances of the effects of chronic rheumatic arthritis; and that the morbid conditions which in them have been regarded as affording the clearest evidence of the joint having at some former period suffered from external violence, are among the most constant effects of this disease."

Dr. A. G. Gerster, of New York, in an article on Subcutaneous Injuries of the Biceps Brachii (*New York Medical Journal*, 1878, vol. xxvii. p. 487), refers to injuries and dislocations of the tendon of the muscle, as follows:—

[1] Mr. Canton also, in his description of a case of this disease, brought under the notice of the Westminster Medical Society, and in which the tendon was divided into four or five slips, remarks that "this condition of the tendon had permitted the head of the humerus to shift upwards, and thereby to articulate with the under part of the acromion process."

"There are cases where the tendon of the long head is but partially lacerated, or in which it is intact, its sheath only being injured. These changes have been for a long time the diagnostic stumbling-blocks of many surgeons. The changes in the outward shape of the shoulder are very slight indeed in these cases; you find, perhaps, a scarcely noticeable synovial effusion in the joint, sometimes an ecchymotic streak in the front of the shoulder; but the functional disturbance is very marked, in fact it seems to be out of proportion with the visible anatomical changes. The patient is unable to use his arm, and endeavours with earnest care to keep it in the same well-flexed condition as if the humerus were broken.

"Passive extension, as well as flexion, of the pronated forearm, causes some pain, active extension and flexion in the same position possible, but a good deal more painful; active flexion of the forearm in supination quite impossible. By pressing the finger tips against various points of the humerus, palpation along the bicipital sulcus, especially between the two tubercles, elicits marked signs of distress."

Dr. Gerster then quotes the case of a carpenter, æt. thirty-five, who fell down a staircase and "struck the ground heavily" (how, it is not said); he instantly felt something snap, followed by a stinging pain in his left shoulder; swelling rapidly ensued, and ecchymosis along the course of the bicipital tendon. A week after the accident active and passive extension were possible, but somewhat painful; passive flexion the same; active flexion in pronation difficult, but possible; active flexion in supination absolutely impossible; even the attempt producing intense pain at the upper bicipital region. Ecchymosis, which before was marked, almost gone. Since even most careful palpation could not prove breach of continuity of the tendon, or signs of dislocation in the shoulder-joint, the diagnosis was: laceration of the tendon, and the corresponding part of the sheath of the long head of the biceps. The arm was restored to usefulness by the use of a simple sling.

After narrating the views of the older surgeons, and mentioning Mr. Soden's case, and Malgaigne's opinion thereof (see p. 26), he continues:—

"So much is true, that no surgeon ever saw the said tendon in *statu luxationis*, and that those who made a diagnosis of dislocation concluded *a posteriori* from conditions consequent upon, or found after, a supposed dislocation."

He then directs his argument against the probability of inward or outward rotation of the arm forcing the tendon from its sheath without either disrupting or causing a luxation of the joint, but says nothing as to the possible effect of direct force. His conclusions are:—

"First, that the luxation of the long head of the biceps never was observed on the living subject in its uncomplicated form, and that its existence is very doubtful, although conventionally accepted by and reprinted in older manuals of different surgeons. Second, in cases presenting compound injuries of the joint and its osseous components, accompanied by rupture of the articular capsule, the inevitable displacement of the tendon is not of much consequence as to the whole injury, and therefore cannot be ranked as a pathological phenomenon of independent standing."

Von Pitha writes as follows (*Handbuch der Chirurgie*, Bd. 4, Abth. 2, p. 46: Luxation der Bicepssehne und Ruptur desselben):—

"Besides the previously mentioned luxation of the biceps tendon upon the tuberosity (as a complication of luxation of the humerus) an uncomplicated dislocation of this tendon has been described by Monteggia, Bromfield (*sic*), and Stanley, occurring during violent exertion, or through sudden inward rotation of the humerus. It is not apparent how in such a manner the biceps tendon is to be lifted out of its sulcus upon the great tuberosity, a dislocation in the way of which stand the insertion of the capsular ligament and of the tendon of the supra-spinatus. The diagnosis has often been made erroneously on the basis of the subjective symptoms, referred to the neighbourhood of the bicipital groove and on the associated disturbance of function. A crackling noise produced by raising the arm has been given as an important symptom. This is, however, poorly adapted to show a luxation of the tendon, as in that case the noise could only be produced by a rapid drawing back (spontaneous reposition) of the tendon from the great tuberosity with the sulcus, which would be accompanied by an instant relief to the patient; while, on the contrary, in the supposed injury the pain is increased during the production of the noise."

He then states that Jarjavay has elucidated this matter, and refers to his paper (see p. 24), adding that, moreover, no one has ever felt a luxated tendon on the great tuberosity[1] or been able to replace it. The trouble requires no manœuvres for the purpose of reposition, but disappears of itself under rest, and cold fomentation of the shoulder, with the arm in a sling.

He believes that although this "mystereriöse luxation der bicepssehne als selbständige dislocation auf das tuberc. majus," thus appears in its true light that other injuries of the tendon of the long head of the biceps are well grounded, instancing its rupture and its separation from its scapular insertion.

Volkmann (*Handbuch der Chirurgie*, Bd. 2, Abd. 2, p. 874. Luxationen der muskeln und Sehnen), after detailing the symptoms described by Cowper, Bromfeild, and Monteggia, says that it is well known that similar symptoms present themselves in relation to other joints, and depend upon conditions entirely different from injuries or luxations of tendons. He alludes to Jarjavay's cases, and their implicit acceptance by Von Pitha, and to the fact that Chassaignac also denies the occurrence of this luxation, adding, that it seems to him, that these authors go too far. He mentions a case recorded by Cloquet, in which a man was able at will to dislocate the biceps tendon either inwards or outwards.

"Autopsies have not thus far shown the existence of an *uncomplicated* luxation of the tendon, *i. e.*, one not associated with luxation of the shoulder. The oft-quoted case of Soden is inconclusive. In future cases of this supposed injury in the living, there will be necessary a much more precise local examination with especial reference to the function of the biceps."

The views in regard to this accident of the other writers whom I have been able to consult, may be readily summarized.

Agnew (*The Principles and Practice of Surgery*, vol. iii. p. 394), says:—

"Though I have seen a number of supposed luxations of the long tendon of the flexor biceps cubiti muscle, yet in only one case, that of a patient of Dr. J. William White, were the evidences of the displacement unequivocal."

[1] Why he insists upon it being on the great tuberosity is not apparent.

Gross (*A System of Surgery*, vol. i. p. 1161), says:—

"The nature of the lesion is always obscure, and, therefore, very apt to be overlooked, or to be mistaken for fracture, sprain, or dislocation of the shoulder. The most reliable symptoms are, inability to flex the arm from loss of power in the biceps, and pain at the seat of the injury, either alone, or in conjunction with more or less prominence of the head of the humerus."

Mr. Flower (*Holmes's System of Surgery*, vol. i. p. 841), says:—

"In the opinion of the last-named surgeon (Dr. R. Adams, of Dublin), the reported cases of dislocation of the long tendon of the biceps with partial displacement of the head of the humerus upwards, are also to be classed as the effects of disease, and not of injury; but the proof of this appears to me not quite so satisfactory as in the former cases."[1]

Prof. Andrews, of Chicago (*International Encyclopædia of Surgery*, vol. iii. p. 670), dismisses the subject thus:—

"Dislocation of the long head of the biceps from the bicipital groove sometimes causes a puzzling deformity after a successful reduction, or even when there has been no luxation. Without being ruptured, this tendon is not certainly known ever to have been dislocated, although commonly so stated by old authors."

Ashhurst (*Principles and Practice of Surgery*, p. 287), says:—

"Under this head (partial dislocation) has been described an injury which appears to consist in a rupture or displacement of the long head of the biceps muscle, allowing the head of the humerus to project anteriorly." He adds in a foot-note: "This inward displacement of the biceps tendon, which Soden and others have considered traumatic, is believed by Canton to be due to the existence of chronic rheumatic arthritis, which may or may not have been the result of injury."

Hamilton (*Fractures and Dislocations*, p. 614), speaking of partial dislocation of the humerus, says:—

"It is quite probable that a majority of these accidents were examples of rupture or displacement of the tendon of the long head of the biceps muscle." "I have seen one example, in which the tendon of the biceps suddenly resumed its position after the lapse of several days, and the prominence of the head of the humerus at once disappeared." "If a displacement of the tendon necessarily causes a displacement of the head of the humerus, it might seem proper to infer that a rupture of the tendon would do the same. The only example of rupture of the tendon which has come under my observation does not confirm this view."

Sir William Fergusson (*A System of Practical Surgery*, Philadelphia, 1853, p. 201), says:—

"That this tendon is displaced in the luxations forwards or backwards (or, perhaps, to speak more correctly, that the head of the bone in such instances is displaced from the tendon), there can be little doubt; *I have seen the change more than once in the dissecting-room.*"

Nancrede (Article on Injuries and Diseases of the Bursæ, *Internat. Encyc. of Surg.*, vol. ii. p. 709), says:—

"It is quite probable that the so-called luxation of the long head of the biceps is really due to chronic bursitis of this sac,[2] for all the symptoms attributed to that

[1] The cases referred to are those in which, like those of J. G. Smith, Stanley, Cooper, and Fergusson, without history of injury, the tendon was found on dissection to be torn or absent. He attributes the majority of these to "chronic rheumatic arthritis," resulting in disorganization and destruction of the intra-capsular portion of the tendon.

[2] The sub-deltoid bursa.

lesion are present in such an inflammation with others which are irreconcilable with the existence of any displacement of the tendon."

Mr. Thomas Callaway (*A Dissertation on Dislocation and Fracture of the Clavicle and Shoulder-Joint*, London, 1849, p. 143) thinks that the accident which is usually described as a partial dislocation of the humerus forwards results from either dislocation or rupture of the long head of the biceps muscle. He describes the cases of Knox, Stanley, and Soden, and then discusses the possibility of distinguishing between a dislocation and rupture of the tendon, premising that he fears that there are but

"few distinctive signs which would materially help us in our diagnosis. Rupture of the tendon usually takes place in old persons in whom the powers of nutrition have begun to fail. It is a milder accident than dislocation. It usually takes place midway between the glenoid cavity and the anatomical neck of the humerus. The capsule of the joint is not ruptured, hence there is but little effusion, and the subsequent inflammation is not severe."

A writer in the *Real Encyclopædia*, vol. xii. p. 451, says:—

"Luxations of tendons, since the confident observations of W. Cowper and Monteggia, have been met with frequently only in the case of a few tendons. Indeed, that of the tendon of the long head of the biceps is contradicted, and has been characterized once (Jarjavay) as a supposed contusion of the subacromial bursa; in another case, as the result of a chronic rheumatic arthritis. (Adams.)"

Mr. Wharton Hood (*On Bone-Setting*, p. 37), says:—

"Displacement of a tendon is certainly of more frequent occurrence than is usually supposed: and, excluding several cases where the symptoms were unmistakable, I have seen numerous others operated upon in which the alteration in the appearance of the joint immediately afterwards, could only be accounted for by this explanation of the injury."

The author of the article on Tendons, in the *Nouv. Dict. de Méd. et Ch.*, vol. xxxv. p. 185, merely alludes to the subject as follows:—

"The luxation of tendons was absolutely denied by Cl. Pouteau, but its possibility was demonstrated by Monteggia, in 1803. Before him, however, William Cowper had recorded the case of a woman who had dislocated the long portion of the biceps in wringing linen."

C. Hueter says (*Grundriss der Chirurgie*, vol. ii. p. 735):—

"It may be remarked that, following the lead of Cowper, Monteggia, and others, a traumatic luxation of the long tendon of the biceps has been accepted by some. P. Vogt is very properly of the opinion that these luxations are only a portion of the injury in case of fracture of the tubercles, or of dislocations of the shoulder, and cannot well arise independently."

Mr. Frederick Treves says (*Surgical Applied Anatomy*, p. 191):—

"In certain violent wrenches of the limb the tendon may slip from its groove and be displaced to one or other side, usually to the inner side. In these cases, also, the head is drawn up under the acromion, and is prominent in front, while abduction is rendered less free than normal, owing to the great tuberosity being sooner brought in contact with the acromion."

Mr. George Murray Humphrey says (*A Treatise on the Human Skeleton*, p. 415):—

"I quite agree with the writer in the *Cyclopædia of Anatomy*, that many of the specimens in which the biceps tendon stops short in the bicipital groove, or

becomes lost in the capsule of the joint, are to be attributed, not to rupture of the tendon, but to the continued effects of chronic rheumatism originating in an accident or commencing spontaneously."

We find thus, in studying the literature of the subject, and I believe that the foregoing represents about all of importance which relates directly to it, that the recorded evidence of the occurrence of dislocation of the tendon of the long head of the biceps muscle may be divided into two general classes: 1. The reports of clinical cases in which certain symptoms were referred by the writers to this displacement, but in which its existence was not otherwise confirmed.

2. The reports of cases in which the tendon of the biceps was found luxated at an autopsy, or during a dissection, but in many of which no clinical history was obtainable.

Mr. Soden's case seems to be the only one which belongs to both classes, and must be considered separately.

Under the first class may be placed the cases of Cowper, Monteggia, Bromfeild, Green, Callender, Mercer, and Hancock. The first three of these, as we have seen, have been assigned by Jarjavay to the category of contusions of the sub-acromial bursa, and with some show of reason. Without entering into a discussion which, on account of the meagreness of the clinical premises, would probably be fruitless, I may call attention to the fact that he does not explain satisfactorily certain symptoms which are stated positively by these writers to have existed and are entitled to as much credence as any other portion of their very careless reports. In the case of Cowper there was said to be "a depressure of the deltoid muscle," and "the two inferior tendons of the biceps"[1] were on the stretch. The difficulty was immediately removed by forcible rotation of the arm. Bromfeild describes the same method of reduction by rotation and the same result of speedy relief, while in Monteggia's case the tendon was said to return to its place and the pain to disappear, while the hand of the injured side was "upon the shoulder of another person," or in the very position which, according to Jarjavay, by making pressure on the inflamed bursa, should excite the most acute pain. The bursitis, which no doubt existed in his own cases, does not account for the depression of the deltoid, the stretching of the "lower tendons" of the biceps, or the sudden relief afforded during rotation. The true character of these cases will doubtless always remain undetermined for lack of sufficient evidence; but, whatever they may have been, it seems evident to me that they are not satisfactorily explained by Jarjavay.

Dr. Green's case can hardly be considered as conclusive, but the mode of disappearance of the trouble was certainly suggestive of a spontaneously reduced luxation of the tendon. Every other symptom can be explained on the theory of lesion of the subacromial bursa, the attachment

[1] The tendon of insertion into the radius, and the bicipital fascia.

of which over the bicipital groove to the sheath of the tendon would account for the pain felt in the shoulder on flexion of the forearm.

Mr. Callender states positively that in his case the tendon could be felt in its unnatural position, and could be replaced, but not retained in its groove. This would be evidence of a very high order if the tendon of the long head of the biceps were a structure easily recognized by palpation through the overlying tissues, but as any one can verify in his own person it is not. If Mr. Callender had stated that he recognized the bicipital groove—a distinct depression, with well-marked, prominent bony walls, having sharp edges—his assertion would have carried much greater weight.

Mercer's case I have only included out of deference to the high authority of Prof. Hamilton, who, as it seems to me, on very insufficient grounds classes it as an instance of luxation of the tendon. It was at any rate not an uncomplicated case, as the original injury was a dislocation of the shoulder, and it may therefore be dismissed without further consideration.

Hancock describes the symptoms of displacement of the tendon in much detail; but as far as I can learn does not seem, himself, ever to have seen a case.

Among those authors, who in a general way admit the existence of the luxation and describe certain symptoms as associated with it, but who do not state that they have ever met with it, may be mentioned Callaway, Gross, Ashhurst, Flower, Hood, and others, whose opinions therefore, though always worthy of respectful consideration, have not in this instance the weight which would attach to them if founded on personal observation.

The second group of cases in which the luxation was found at autopsies includes those of Gregory Smith, Knox, Stanley, Hargraves, Astley Cooper, and Fergusson, which have been so clearly shown to be in all probability examples of changes in the joint produced by rheumatoid arthritis, and not by traumatism, that no further consideration of them is necessary.

In discussing the case of Soden, which I have reserved to the last, as being by far the most important, I wish to admit to the fullest possible extent the weight of the arguments advanced by Malgaigne, Adams, and Smith in favour of the pathological causation of the displacement of the tendon. It seems to me, however, that certain important facts remain unexplained in the light of this theory. Three weeks after the accident the head of the bone was found drawn up under the acromion and unnaturally prominent in front; abduction was impossible; flexion of the forearm intensely painful, etc. Although the patient is stated to have been "of rheumatic habit," there is no mention made of any previous trouble with the shoulder, and it seems hardly probable that these marked changes occurred solely as a result of a rheumatic inflamma-

tion of the joint of three weeks' duration. They may partly have been due to a bursitis such as is described by Jarjavay, which would account for the crepitation, painful abduction, puffy swelling over the front of the joint, etc. etc., and which, it would be necessary to suppose was prevented from subsiding, as in Jarjavay's cases, in two, three, or four days, by the supervention of the rheumatic inflammation. But even admitting the plausibility of this theory, it hardly seems to me that it is in perfect accord with the result of the autopsy. I refer here especially to the *degree* of displacement of the tendon as compared with the duration of the supposed chronic rheumatic arthritis and with the slight and certainly doubtful concomitant changes in the joint. The rheumatoid inflammation was believed to date its origin from the fall which the patient had in May, 1839. He died in November, 1839, six months later, and the tendon was found, not only displaced as to its intra-articular portion, but *out of the bicipital groove.* Now, it is evident that viewing the progress of the case in the light of the theory of Messrs. Smith and Adams, that while displacement of the upper part of the tendon over the smooth rounded head of the humerus might be expected to occur early in the disease, on the other hand, detachment of the tendon from the firm fibrous prolongation of the capsule and the synovial membrane which holds it in its groove must necessarily be a much later phenomenon. The amount of pressure required for this purpose either must be very great when it is done suddenly, or must be distributed over a long period of time before it can produce the necessary weakening and disintegration of structure.

Fig. 2.

The accompanying cut, which represents the right shoulder-joint in the case of Chas. Mailly, reported by Mr. Adams, as parallel with that of Mr. Soden, illustrates the point to which I refer (Fig. 2). It will be seen that while the intra-capsular portion of the tendon is dislocated inwards, the displacement does not extend beyond the summit of the bicipital groove, in which the rest of the tendon lies.

And yet this patient had been ill for seven years or more, and bedridden for five years; and the joint was extensively diseased. The left shoulder-joint was symmetrically affected, particularly as regarded the tendon of the biceps.

Mr. Adams himself says, in regard to the condition of the joint in Soden's case :—

"As to the anatomical examination of the joint, it will be recollected that the disease had been only six months established, and, therefore, that the more striking results of chronic rheumatic disease should be found was not to be expected. Those which were noticed, however, were such as might be supposed to represent the anatomical character of chronic rheumatic arthritis of the shoulder at an early stage."

It would appear, therefore, that, although the case cannot be considered as it originally was, as demonstrating beyond a doubt the possibility of the accident, on the other hand, it cannot be summarily dismissed as one of the many instances of *post hoc ergo propter hoc* reasoning, which have led to the mistaking of lesions due to chronic arthritis for those caused by traumatism.

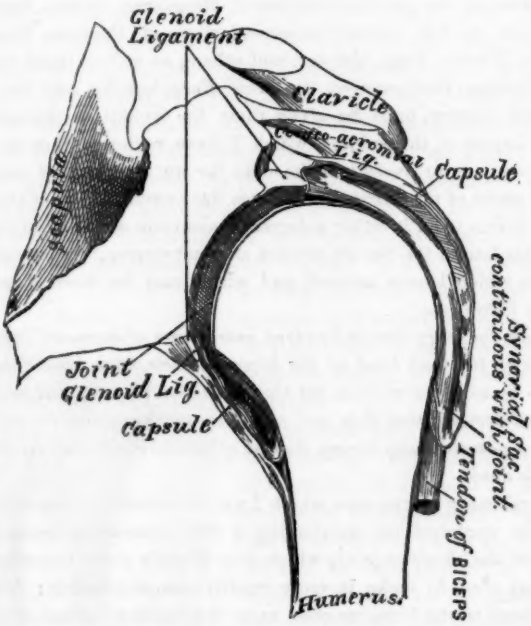
In addition to the positive opinions of Malgaigne, Adams, Smith, and Jarjavay, the no less strongly expressed views of Pouteau, Von Pitha, Volkmann, Hueter, Vogt, Gerster, and others, as well as those contained in the *Nouveau Dictionnaire*, the *Real Encyclopädie*, and the various treatises on surgery, must be given their due weight in discussing the historical aspect of the subject, which I have reviewed thus at length, in order to supply to every one the data for an independent conclusion. A careful study of the foregoing evidence has convinced me of the impropriety of basing upon it either a dogmatic assertion or denial of the existence of this lesion, the Scotch verdict of "not proven," representing the opinion at which I have arrived, and which may be more formally expressed as follows:—

*Although for more than a hundred years cases of supposed luxation of the tendon of the long head of the biceps muscle have been reported or alluded to by surgical writers, yet they have been so poorly observed or so carelessly described, that they fail altogether to carry conviction, the one case which possesses any strong element of probability being itself open to reasonable doubt.*

As introductory to the case which I am now about to describe, I may perhaps be pardoned for mentioning a few elementary points, in the anatomy of the shoulder-joint, which bear directly upon the subject, and which may tend to make it more readily comprehensible: The large rounded head of the humerus rests upon the shallow surface of the comparatively small glenoid cavity, which is not more than one-third the size of the former. The depth of the cavity is, however, somewhat increased by a narrow fibro-cartilaginous rim, the glenoid ligament. Overhanging this cavity is a vaulted arch formed by the coraco-acromial ligament, uniting the two processes from which it takes its name. Arising from the margin of the glenoid cavity, embracing loosely the head and anatomical neck of the humerus, and extending down to be attached below the tuberosities, is the capsular ligament, which has been described as "a sac having two apertures, of which the lower is by far the larger." This sac is so loose and capacious that it could contain a body nearly twice as large

as the head of the humerus; it gives no aid in maintaining the latter in contact with the glenoid cavity, and does not appreciably limit its movements. With its fibres are intermingled those of the tendons of insertion of the supra- and infra-spinatus and subscapularis muscles, which materially add to its strength. It is also reinforced in front and within by the tendon of the long head of the biceps which arises from the summit of the glenoid cavity, where its fibres are intimately blended with the glenoid ligament, and passes directly over the top of the head of the humerus within the capsule (Fig. 3), and then down exactly in front of the joint

Fig. 3.



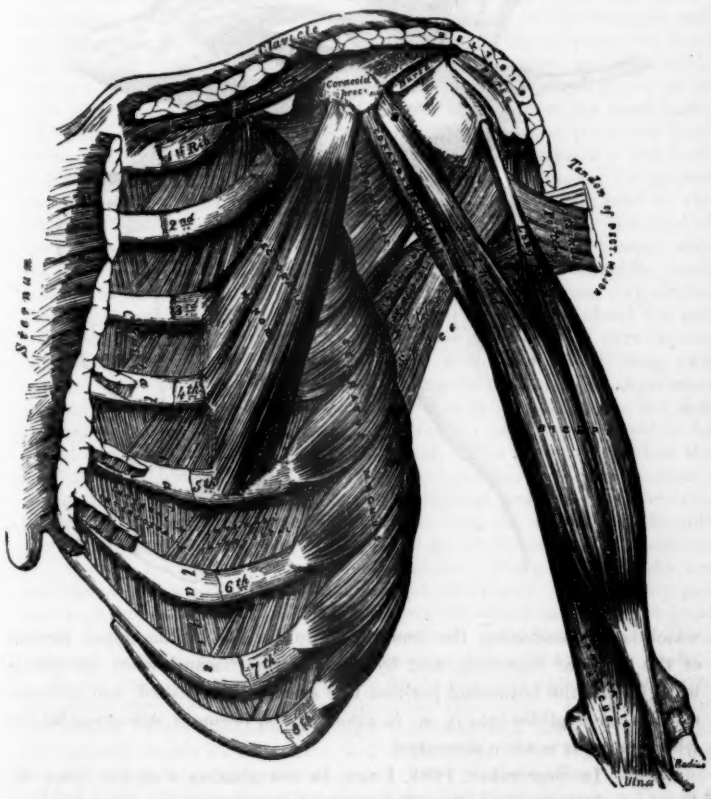

in the sulcus—the bicipital groove—between the greater and lesser tuberosities. A prolongation of the capsular ligament, and within that another of the synovial membrane, cover the tendon at this point, and convert the groove into a canal. This is strengthened externally by the insertion of the tendon of the pectoralis major into its outer lip.

The bicipital tendon, however, at least when the forearm is fixed, would manifestly have a tendency to draw downwards the head of the humerus, and certainly cannot be considered as holding it in its articular cavity. This is effected chiefly by atmospheric pressure, aided greatly, however, by

the action of the deltoid, the clavicular fibres of the great pectoral, and the supra-spinatus, all of which muscles act to great mechanical advantage as direct elevators. The arm is turned outward by the action of the muscles inserted into the greater tuberosity, the supra- and infra-spinatus and teres minor; it is rotated inwards by the subscapularis assisted by the sternal fibres of the pectoralis major; it is abducted, or drawn directly out from the side by the deltoid, assisted by the supra-spinatus. It is then lowered by the latissimus dorsi and teres major muscles.

Between the outer and anterior portion of the capsular ligament and the under surface of the deltoid muscle is situated a large bursa (Fig. 4),

Fig. 4.

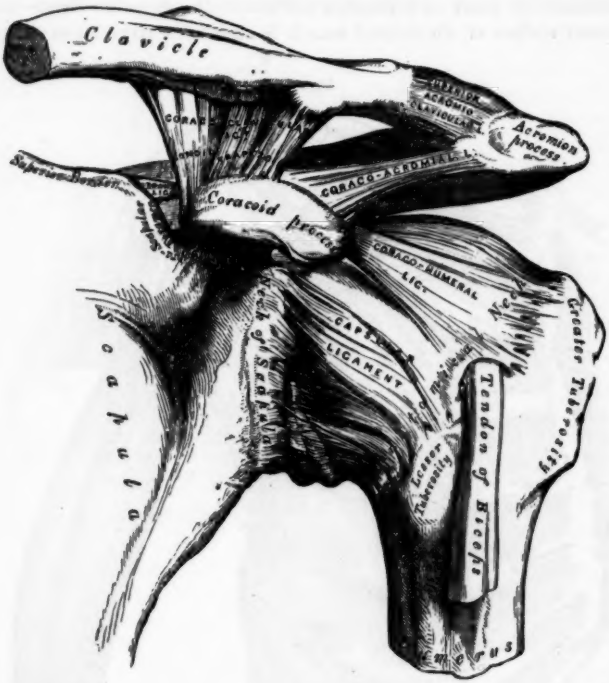



which, by reducing friction, facilitates the movements of abduction and rotation. The lower wall of this bursa is attached by some strong connective tissue fibres to the underlying parts; including the fibrous sheath

of the bicipital tendon. Its upper wall is attached to the under surface of the deltoid muscle. Another bursa lies beneath the subscapularis muscle, and almost invariably communicates with the general synovial cavity of the joint.

Between the lower surface of the acromion and the upper surface of the head of the humerus there exists normally a considerable interval (Fig. 5),

Fig. 5.




which is occupied when the arm hangs by the side by the upper portion of the capsular ligament, and by some fibrous tissue;[1] when the arm is brought into the horizontal position this space is diminished, and the subdeltoid bursa glides into it, or, in other words, becomes sub-acromial, by which name it is often described.

CASE. In September, 1881, I saw, in consultation with Dr. Thos. K. Reed, of Atlantic City, New Jersey, the following case:—

[1] A case of paralysis of the deltoid is recorded by Nannoni, in which four fingers could be lodged between the humeral head and the acromial vault. Paulet, *Traite d'Anatomie Topographique*, p. 677

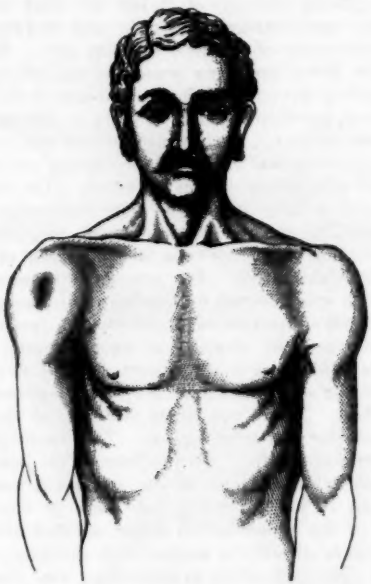
T. W., a carpenter, aged 37, previously healthy in every respect, while ascending a ladder, with his arms full of tools, lost his balance, and fell backward from a height of six or eight feet. While falling he made an effort to save himself, and so far succeeded as to effect a semi-rotation of the head and trunk, which brought the right anterior surface of the body into the most dependent position. His fall was arrested by a porch about fifteen inches in height, upon which the front of his right shoulder struck, his right ear just grazing the edge of it, but his head escaping all other injury. There was immediately acute pain and swelling over the right shoulder, with helplessness of the arm on that side. He was seen in a few minutes by Dr. Reed, and then presented the following phenomena: He was sitting, holding the hand of the injured side in the left hand, palm upward, and turning its ulnar border strongly in the same direction, or, in other words, was holding it in a position of external rotation, or forced supination. The forearm was flexed on the arm at an obtuse angle, and the elbow was held close to the side of the trunk. On releasing the hand and allowing the arm to hang by the side there was instant and irresistible rotation of the humerus inward, which occurred to such an extent as to turn the palmar surface of the forearm and the palm of the hand backward, and even slightly outward. Any attempt to remove the elbow from contact with the side was followed by a seeming displacement of the head of the humerus, which slipped forward and inward, increasing the projection on the front of the joint, although at no time could the head of the bone be felt in the axilla, and it was always possible to place the hand of the injured side on the sound shoulder, keeping the elbow in contact with the front of the chest. There was great swelling of the shoulder, most marked over its anterior and outer aspects. This swelling was soft, almost fluctuating, and not ecchymotic. On the front of the joint, about one and a half to two inches below the level of the acromion, was an oval depression, about an inch in length, and a half inch in depth, its long axis parallel with that of the humerus. A finger inserted into this depression seemed to come almost directly in contact with the bone, nothing but skin and subcutaneous tissue appearing to intervene; and these seemed to be bound down tightly at this particular point. The patient described the condition as the skin having "grown fast" to the bone. There was sharp lancinating pain in the shoulder on the slightest movement of the arm, which was preternaturally mobile. On removing the elbow from the side a creak or "squeak" could be plainly heard by the bystanders, resembling, but moister than, the sound of true crepitus. There was a slight but undoubted depression beneath the acromion externally. An axillary pad and a handkerchief so applied as to carry the elbow inward gave great relief to the patient, although he still suffered considerable pain, which persisted in varying, but gradually decreasing, intensity for some weeks.

At the time of my visit, about two weeks after the accident, the above symptoms were noted, and, in addition, the following: The vertical circumference of the shoulder, although there was still some swelling, was half an inch to one inch less than that of the sound side (Fig. 6). A line of ecchymosis, beginning about on the level of the axillary border, extended down the arm, following closely the line of the biceps. This had made its appearance three or four days after the injury. It persisted for some weeks, gradually finding its way down the radial side of the forearm almost to the wrist.

When the forearm was extended upon the arm, a painful degree of

tension was produced along the line of the biceps, the border of which muscle became plainly evident beneath the skin; this pain extended to the point of insertion in the radius and was described by the patient as even running down to the wrist. Flexion of the forearm was possible with difficulty, the movement being tremulous and void of force;

Fig. 6.



it was associated with a sharp pain over the head of the humerus. Flexion of the supinated forearm was much more painful than flexion during pronation. In the former case the sensation described by the patient was one of "dragging" over the head of the humerus. The oblong or oval depression over the head of the bone (Fig. 6) had, with the subsidence of the swelling, become more rounded in appearance, but was still very distinctly marked. At this point, and for a little distance above and below it, a longitudinal furrow could be plainly felt in the bone which seemed to correspond accurately with the situation of the bicipital groove. This furrow was empty. To its inner side could be felt indistinctly a round movable body, rolling slightly beneath the fingers, and thought at the time to be the bicipital tendon. Neither this nor the groove could be felt on the sound shoulder. All attempts at replacement were futile.

On elevating the arm, it was seen that the scapula moved largely with the humerus, the acromion became prominent on the summit of the shoulder (Fig. 7), and the axilla of the injured side as compared with that of the sound side was greatly lengthened (Fig. 8). The angle of the scapula on the injured side, when the arm was raised above the head, was carried out quite to or a little beyond the side of the chest.

The slight depression immediately below the tip of the acromion still existed, with considerable fulness over the upper, front, and inner aspects

Fig. 7.

of the joint, apparently due to an abnormal projection of the head of the humerus in that region. There was slight shortening on measurement from

Fig. 8.

the acromion to the external condyle, but not more than half an inch, possibly a little less. The tendency to spontaneous rotation of the arm was

still felt, but was much less noticeable. The arm was very mobile, and the head of the bone could be rotated freely in every direction. There was no history of rheumatism in the patient himself or in his family.

In October, 1883, the patient was again seen and examined. He had regained almost entire use of his arm, although the disability had been almost complete for a year and quite marked for eighteen months. Flexion of the forearm on the arm was complete and painless.

Elevation of the arm above the head was still accompanied by undue movement of the right scapula, the acromion becoming unnaturally prominent and the angle going somewhat nearer the side of the chest than on the left side (see Fig. 9). The bicipital groove could still be felt, and possibly

Fig. 9.

the tendon to its inner side. On raising the arms equally the depression which normally appears at the tip of the acromion was apparent on the left or sound side, but could not be seen on the right (see Fig. 9). With the arms pendent there was a noticeable difference between the shoulders, the deltoid on the right side being shorter and its curve rounder and fuller, while at the same time the acromion projected more than normal (see Fig. 10).

It will be seen, I think, on carefully analyzing these symptoms, that taken together they lead almost irresistibly to the conviction that, in this case at least, there had been true traumatic luxation of the bicipital tendon, and that each one of them is susceptible of rational explanation on this theory.

They may be enumerated as follows:—

1. *The recognition of the bicipital groove, empty.* This, which was the symptom on which the original diagnosis was founded, is perhaps the

most important of the group, as, if its existence be admitted, it is absolutely pathognomonic. In very thin persons the groove may be felt through the anterior fibres of the deltoid which overlies it; in muscular persons not

Fig. 10

so readily. Empty of its tendon its sharp edges, its deep sulcus, its situation precisely in front and a little to the inner side of the head of the bone, its movement with the latter, might be expected on *à priori* grounds to render it much more easily recognizable than in its normal condition.

It certainly seemed to me, when I first saw the patient, that it could be readily and unmistakably felt, but I am glad in this respect, as well as in others, to have the corroborative opinion of so distinguished a surgical anatomist as Professor Agnew, to whom the case was submitted for criticism, and who was equally convinced of the facts above stated.

2. *Recognition of the tendon itself.* Of this I was by no means positive. It seemed that the tendon could with difficulty be felt a slight distance to the inside of the joint, but it was so uncertain that I do not attach any weight to this symptom, which was of but doubtful value.

3. *Inward rotation of the arm.* This was very peculiar, and could only be simulated, as far as I know, by that which is said to occur after frac-

ture of the great tuberosity in which the external rotators, the supra- and infra-spinatus and teres minor being rendered powerless the arm is turned inwards by the subscapularis assisted by the sternal fibres of the pectoralis major. Something analogous to this took place, I believe, in this case. Although, as I have said, there was no conclusive evidence as to the position of the tendon, there are good reasons for supposing that in any case in which it was displaced by direct violence it would probably go inwards. The tendon of the great pectoral arching above the groove and inserted into its outer edge (Fig. 4), and at a higher level the tendon of the supra-spinatus inserted into the great tuberosity would probably prevent it in the majority of cases from passing outwards.[1] If then it went in the opposite direction it would lie directly on the tendon of the subscapularis, which would thus be stimulated to spasmodic action, and would tend strongly to rotate the bone inwards,[2] acting in the new position of the bone, as will presently be seen, to much greater advantage than its antagonists. Then too the tendon itself, in its new position, would strongly aid in the movement of internal rotation.[3]

4. *A slight depression under the tip of the acromion; a prominence of the shoulder in front; and a flattening behind.* It will be observed that in cases of rheumatoid arthritis in which the bicipital tendon is atrophied or displaced, the head of the bone is invariably found to be elevated and to lie just beneath the acromion. Mr. Soden gives excellent reasons for supposing that the course of the tendon permits it to act in the place of a capsular muscle running from the ribs to the humerus, and opposing the upper capsular muscles. This opinion as to the function of the intra-capsular portion of the tendon appears to be that of the large majority of surgeons. I have found none who dispute it.[4] If now, this tendon is displaced by violence, there can be no reason why, just as when it is dislo-

[1] "In its course between the tubercles it plays upon the inner rather than the outer one." Humphry, op. cit., p. 414.

[2] Duchenne (*Physiologie des Mouvements*, p. 84) describes the subscapularis as the great anterior—or internal—rotator of the humerus.

[3] See Humphry, op. cit., p. 414. "By its pressure upon the inner tubercle the tendon prevents undue rotation of the head of the humerus outward," *et seq.*

[4] "It strengthens the upper part of the articular cavity, and prevents the head of the humerus from being pressed up against the acromion process when the deltoid contracts." Gray, p. 310. "The biceps tendon strengthens the upper part of the joint . . . and prevents the head of the bone from being pulled too closely upwards under the acromion." Treves, op. cit., p. 191. "Several purposes are served by the peculiar course and disposition of this tendon. It strengthens the capsule at the upper part, and assists to prevent the head of the humerus being pressed against the acromion by the contraction of the deltoid and other muscles." Humphry on the Skeleton, p. 414. "The biceps tendon tends to prevent the head of the humerus being pulled too closely upward against the under surface of the acromion." Henry Morris, Anatomy of the Joints, p. 218. "Its evident function is to apply the humeral head to the glenoid cavity and to prevent its displacement in shocks directed from below upward." Paulet, op. cit., p. 678.

cated from disease, the powerful deltoid, aided by the supra-spinatus[1] and the clavicular fibres of the pectoralis major, should not draw it up into close proximity to the acromion, and this seems to be what occurred in the present case, the bone at the same time being drawn inward by the sternal fibres of the pectoralis major, and by the latissimus dorsi and teres major, all of which are placed somewhat on the stretch by this elevation of the humerus. This drawing inwards permits, in spite of the elevation of the head of the humerus, of the little depression beneath the tip of the acromion. While on the one hand, also, the origin and insertion of the supra-spinatus, an active external rotator, are approximated, the origin and insertion of the subscapularis are removed from each other, favouring strongly the internal rotation above described.

5. *Diminution in the vertical circumference of the shoulder.* That this existed even during the period of swelling was very significant. It is just the reverse of the sign of dislocation, originally pointed out by Mr. Callaway, and was evidently due to the elevation of the head of the humerus.

6. *Shortening of the arm as measured from the tip of the acromion to the external condyle.* This should, of course, in the absence of symptoms of fracture, be referred to the same cause.

7. *Elevation of shoulder, tilting up of acromion, and elongation and narrowing of axilla when the arm was carried upwards.* This was also due to the elevation of the humerus. The muscles which constitute the axillary borders, the great pectoral and latissimus, already on the stretch, as has been said, were made more so by the abduction of the arm, became tense and elongated, and gave rise to the peculiar appearance of the axilla which contrasted strongly with the easy natural curves of that on the sound side. (Fig. 8.)

The tilting up of the acromion was due to the presence of the head of the humerus just beneath its tip, the two bones impinging on the injured side when they formed a large obtuse angle, while on the other side they hardly touched until the arm was lifted a little above the head, or had at least attained a horizontal position.

This symptom (as will be seen by reference to Figs. 9 and 10) persisted, though to a less degree, two years after the accident. To the same cause —elevation of the humerus—are due the shortened deltoid, the unnaturally rounded outline of the shoulder, the lessened vertical circumference, the absence during elevation of the arm of the normal dimple found at the tip of the acromion superiorly, and the slight tilting of the scapula, all of which appearances are admirably shown in the same cuts.

8. *The peculiar depression situated over the bicipital groove.* Unless the "depressure in the deltoid muscle" described by Cowper, referred to a

[1] Duchenne (op. cit., p. 75) says that this elevating action of the supra spinatus is much more energetic and important than is generally supposed.

similar appearance, I can find no mention of any such exact phenomenon in surgical writings, either in connection with this or any other injury of the shoulder-joint. I believe it to have been probably caused in one of the following ways, the last of which I am inclined to favour, though it does not appear that anatomical considerations alone enable us exactly to determine the point:—

1. The tendon in its displacement from the groove may have dragged with it a portion of the inner edge of the subdeltoid bursa attached to its sheath, and through its medium, put on the stretch and tied down some of the fibres of the deltoid muscle itself. The injury being followed, just as in a bad sprain, by rapid and extensive synovial effusion, involving not only the bursæ but the general cavity of the joint, this swelling manifested itself wherever the capsule and the bursæ permitted of distension. Over the region of the groove, however, they were drawn so tightly and were so tense by reason of their connection with the sheath of the tendon that swelling could not occur. (The succeeding symptom, No. 9, will explain my reason for thinking that this sheath was put greatly on the stretch, but not lacerated.) The drawing of the muscular fibre with them would account for the ease with which at the bottom of this dimple the bicipital groove could be felt, covered apparently with little else than skin. The chief objection to this view lies in the fact that the subdeltoid connective tissue, though exceptionally very dense and firm, is, as a rule, loose and yielding, and would probably stretch considerably without materially displacing the muscle itself. 2. There may have been rupture with retraction of some of the fibres of the deltoid muscle directly over the seat of injury. 3. The bursal and synovial swelling pushed before it, and slightly separated the adjacent edges of the deltoid and pectoralis major muscles, leaving the interspace over the line of the groove, without superjacent muscular tissue. The larger size of the bursa *external* to the groove,[1] and the greater freedom from tension of the capsule and synovial membrane at that point—the tendon having been presumably displaced inward—would account for a greater proportionate displacement outward of the anterior edge of the deltoid, giving the depression the appearance of being somewhat external to the normal situation of the groove between that muscle and the pectoralis major.

Examination of the dissected shoulder shows that a line drawn from a little within the tip of the acromion directly down over the front of the joint, will at a point below the head of the bone intersect the bicipital groove and the intermuscular fissure in question, or will at the furthest be a few lines outside of that fissure. Now it must be remembered that in this case the deltoid was markedly shortened, and its anterior edge consequently displaced upward, so that the peculiar depression and the part of

[1] See Morris, op. cit., p. 221.

the interspace overlying the bicipital groove were in the same general locality.

It is well known that the synovial swelling which sometimes makes its appearance in the groove between the pectoralis major and the deltoid muscles during the course of a synovitis may be distinctly bilobed from pressure of the unyielding biceps tendon, then *in situ*, and this resembles more closely the symptom under consideration than any other development associated with disease or injury of this joint.[1]

While, therefore, I do not deny the possibility of the depression having been caused in one of the two preceding ways, I think on anatomical grounds that the latter explanation is the most probable, though I do not pretend to consider it as indubitable.

9. *The line of ecchymosis following and strictly limited to the course of the biceps muscle.* This was most marked and characteristic, appearing only some days after the injury, and slowly gravitating down the arm in the line of the sheath of the muscle. It might occur, of course, in a fracture between the tuberosities extending into the bicipital groove, or it might follow a rupture of the tendon. If the sheath of the tendon were torn the ecchymosis would possibly be less strictly limited to the area of the muscle.

10. *A creak or "squeak," heard distinctly on carrying the elbow away from the side.* This was thought at the time to be due to the play of the tendon in its new position, but it is more probable that it was caused by the accompanying bursitis. To elicit it it was not necessary to take the arm more than a few inches from the side of the chest, but then it must be remembered that the head of the bone was already high up beneath the acromion, and that the bursa was largely distended, so that compression of the latter between the humerus and the acromion would begin very early in the movement of abduction. This noise was not heard on *flexion* of the elbow, another fact which renders it probable that its origin was bursal and not tendineal. It was not to be confounded with true crepitus, which could at no time be elicited.

11. *Flexion of the forearm on the arm was painful, the pain being sharp, lancinating, and felt at the front of the shoulder; flexion during supination was much more painful than flexion during pronation.* The existence of pain during flexion of the forearm can readily be understood. The reason for the difference between pronation and supination may best be explained by the following article by C. Hueter,[2] which I trans-

[1] Lorsqu'une collection liquide s'amasse dans la synoviale, le gonflement qui en résulte arrondit le moignon de l'épaule et en fait disparaître les saillies extérieures; mais le tendon du biceps se trouvant de plus en plus distendu, coupé, pour ainsi dire, la tumeur en deux, de sorte que celle-ci semble être bilobée. Il est clair que si la collection liquide est située en dehors de l'articulation, on n'y observera rien de semblable." Paulet, op. cit., p. 678.

[2] Zur Diagnose der verletzungen des M. Biceps Brachii. Archiv für Klinische Chirurgie, 1864, Bd. 5, s. 321.

cribe somewhat fully on account of the important bearing of the symptom to which it relates.

A student suddenly felt, while fencing, a severe pain in the upper third of the forearm exactly corresponding to the long head of the biceps; thenceforth he had on account of this severe pain, which manifested itself at every attempt at motion, lost the ability to bend the forearm actively while it was supinated. But on the contrary, when the forearm was in pronation, active flexion was easy and painless. This particular symptom in an injury which certainly must have been associated with a lesion in the course of the long head of the biceps or with a rupture of the muscular fibres, or with an injury of the sheath of the tendon, was to me especially striking, because theoretically I had believed, on the contrary, that we should expect a marked pain on flexing the pronated forearm. It is well known that when the forearm is pronated, the points of origin and insertion of the biceps are further apart than in supination, its muscular fibres being also stretched to a greater degree.[1] A contraction of these must on that account, in this position, so much the more draw apart from each other the already separated fibres or much more strongly drag the tendon against the wounded sheath.

Nevertheless, the elucidation of the symptoms becomes very easy if we sufficiently consider the physiological action of the biceps. In the pronated forearm, the radius crosses the course of the ulna in such a manner that it can be supported in the movement of flexion of the latter; the moving forces which have their *points d'appui* in the ulna can, by the motion of the pronated forearm under these favourable circumstances, move the radius in the direction of flexion with very slight exertion. In supination both bones lie next to each other, and on that account the mechanical relations become so unfavourable for their common flexion that the contraction of the brachialus internus[2] is no longer sufficient for the completion of this motion. At least one feels on flexion of the supinated forearm, even although there is nothing to overcome but gravity, that the biceps swells. But in the pronated forearm, flexion is not only possible through the unaided action of the brachialis internus, but this flexion is well known to be, as a rule, exclusively completed through this muscle. If one then, with moderate force, completely flexes the pronated forearm, it may easily be felt that the belly of the biceps muscle remains soft and flabby. In a similar complete flexion of the supinated forearm, there may be plainly felt, on the contrary, a contraction of the biceps, and by measuring the circumference of the arm at its middle, there is found in the latter instance an increased circumference of several lines. In very energetic movements the biceps muscle also contracts in flexion of the pronated forearm, but there always remains noticeable, in a similarly strong complete flexion of the supinated forearm, a striking difference in the tension of the muscle. Clearly a contraction of

[1] Gerster translates this: "The tendon of the biceps is stretched to its full length in supination, in pronation it is wound around the radius." (Op. cit., p. 498.) "The sentence in the original is as follows: Bekanntlich sind bei pronirtem Vorderarm die Insertionspunkte des M biceps weiter von einander entfernt, als bei Supination, seine Muskelfäsern, also in höherem Grade gespannt; eine Contraction derselben muss desshalb in dieser Stellung die getrennten Fasern um so mehr auseinander-zerren, oder die Sehne gegen die verletzte Scheide um so kräftiger andrängen."

[2] Brachialis anticus.

the biceps in the pronated forearm must always next occasion a movement of supination; *i. e.*, the tendon rolled around the neck of the radius must be unrolled before its flexing action can take place, and therefore we are accustomed in movements of moderate force not to set that muscle in action. In powerful movements, however, its contraction is not superfluous; its supinating action must then become equalized through the contraction of the pronators. In supination the action of the biceps is indispensable, both on account of the above-mentioned unfavourable position of the two bones of the forearm and also because the muscles which can largely aid in flexion of the forearm, especially the pronator teres and the flexor carpi radialis, have at the same time a pronating action, and therefore cannot contract.

The above described symptom, which led me to a consideration of the facts detailed, makes it clear that in flexion of the pronated forearm, the biceps muscle is not usually brought into action, and on that account a separation of its injured fibres does not occur during this movement. We have also in this symptom a means of diagnosticating injuries of the biceps in doubtful cases.

12. *When extension of the forearm was attempted, a tense line along the edge of the biceps could be both felt and seen.* The cause of this is obvious.[1]

13. *The pain felt over the joint was also felt along the line of the biceps as far as its insertion, and the patient still has a "drawing" sensation over that region.* The explanation of this is to be found in the fact that Mr. Hilton long ago called attention to:—

"That the same trunks of nerves, the branches of which supply the groups of muscles moving any joint, furnish also a distribution of nerves to the skin over the same muscles and their insertions, and that the interior of the joint receives its nerves from the same source."[2]

14. *The arm was preternaturally mobile for some time after the accident.* The support of the tendon being withdrawn, this was to be expected.[3] It is important, however, to note that at *no* time was there any approach to anchylosis, which might have been suspected from the tilting of the

[1] The stretching of the "two inferior tendons" of the biceps, described by Cowper and Mangetus, will be remembered. This expression, which does not occur in modern anatomical or surgical writings, is explained by the following passage from the *Theatrum Anatomicum* of Mangetus (Geneva, 1717, p. 39), and clearly refers to the bicipital fascia and to the radial tendon of insertion: "Accuratissimus Anatomicus, Guilelmus (sic) Cowper super Musculo Bicipite, seu potius ejus tendine, haec observat. Tendo hic duplex est, ejusque pars exterior, quæ tenuis est, transit oblique super *Musculum Pronatorem Radii Teretem* & instar membranæ se se expandens, jungitur *Membranæ Musculorum Communi*, que omnes extefnos Carpi ac Digitorum Musculos complectitur. Altera vero robustior multo ac rotunda in superiori Radii capite inseritur. Duplex autem, addit, tendinosa hujus musculi terminatio (quamvis à nullô autore, quod sciam, observato fuerit) est admodum evidens, & à nobis primùm conspecta ante aliquot annos," etc. For the original, see Cowper, op. cit., pp. 74, 75.

[2] "By its passage along the bicipital groove it assists to render the head of the humerus steady in the various movements of the arm and forearm." Humphry, op. cit., p. 413. See also Cloquet, *Anatomie Descriptive*, p. 199.

shoulder and the appearance of the axilla. The head of the bone was always freely movable with no trace of adhesion.

15. *The position of the patient after the accident.* This was markedly different from that seen after fracture of the clavicle, dislocation of the humerus, etc. No attempt was made to support the humerus, as in those cases, by the hand placed under the elbow. The effort was obviously directed to overcome: (1) the internal rotation of the humerus; and (2) the drawing inwards of the head of the bone; and for these objects the hand was held strongly with its ulnar border upward, and the elbow was brought in front of the chest.

16. *The character of the force producing the difficulty.* This was peculiar in the fact that the *front* part of the shoulder struck first, the height of the piazza protecting the head from injury. It was, as will be evident on careful thought, just such a blow as might be expected to produce the injury in question, the force coming evidently from above and outside, and striking just in the region of the tendon; the biceps at the time was probably relaxed, though this is a matter of conjecture.

These symptoms, as I have said, seem to me collectively to constitute very strong evidence in favour of the existence in this case of a luxation of the tendon, but a few words may be added in regard to diagnosis.

From *chronic rheumatic arthritis*, the entire absence of rheumatic history, the cause and the progress of the case sufficiently separate it, all the diagnostic symptoms coming on in a healthy joint within a few moments of the accident. Those which remained after the subsidence of the swelling and traumatic inflammation were evidently due to the new position of the head of the bone and not to any arthritic process.

From uncomplicated *subdeltoid bursitis*, it might be diagnosed by the elevation of the head of the bone, the accompanying changes in the shape and size of the shoulder, and all the symptoms referable to the biceps muscle itself; *i. e.*, the ecchymotic line, the difference in flexion between pronation and supination, etc. The much greater severity of the accident also constitutes a marked point of distinction. It will be noticed that two of Jarjavay's patients were nearly or quite well in three days, one in nine days, one in three weeks, and the other in six weeks, in the latter instance in spite of very meddlesome treatment.

These symptoms also differentiate it from *fractures* near the joint, the only one of which that at all resembles it being *fracture of the greater tuberosity*. In a supposed case of this injury, Gurlt[1] noted the symptoms as extreme passive mobility at the shoulder, complete loss of voluntary outward rotation, and partial loss of voluntary elevation of the arm; crepitation could be elicited by vigorous rotation. There is to this extent a superficial resemblance between the cases, but it goes no further, all the

[1] Quoted by Stimson—*Treatise on Fractures*—p. 363.

other symptoms noted in my case being absent or at least undescribed. In the cases of Mayo (quoted by Bransby Cooper) there was flattening of the deltoid, and abduction, instead of increasing the deformity, which resembled a luxation, caused its disappearance. In the cases of R. W. Smith[1] there was probably a concomitant luxation; the transverse diameter of the shoulder was apparently much increased.

In Stimson's case,[2] voluntary abduction was possible; there was demonstrable separation between the two tuberosities, the lesser one moving with the shaft of the humerus; there was crepitus, and the shoulder presented no deformity, except general swelling. In my case the entire head of the humerus could always be felt to move with the shaft, there was no crepitus, the transverse diameter of the shoulder, if changed at all, was lessened, certainly not increased; the groove felt in front of the head of the bone was perfectly fixed. If it had been a line of fracture or separation between the two tuberosities, the outer lip should have been more or less mobile. The symptoms directly referable to the biceps muscle complete the diagnosis.

From *dislocation of the humerus* it could readily be distinguished by the preternatural mobility, the presence of the head of the bone in or above the glenoid cavity, the ability to place the hand on the opposite shoulder, the diminished circumference of the injured shoulder, etc.

In all of these cases there are to be mentioned, in addition, the *peculiar* symptoms of the case, the recognition of the groove, the depression in front of the shoulder, the line of ecchymosis, the early movement of the scapula during abduction, the inward rotation of the arm, the difference between flexion in pronation and that in supination, etc. etc.

The condition with which it is most likely to be confounded is *rupture of the biceps tendon*, apparently a more frequent accident.

As might be expected, several of the symptoms coincide. The painful flexion, the difference between pronation and supination, the sharp pain at the shoulder-joint, the approximation between the head of the humerus and the acromion,[3] etc. etc., are all present. There is, in addition, however, in the large majority of the reported cases of rupture, a larger ecchymotic swelling coming on almost immediately; no mention has been made of the peculiar depression; or of the internal rotation of the arm; or of the line of tension along the edge of the biceps; the accident has invariably been caused by violent muscular action, not by direct force; and there is also in most of the cases of rupture[4] a history of the sudden appearance on the front of the arm of a more or less firm tumour, consisting of the con-

[1] Fractures in the Vicinity of Joints, p. 176.

[2] Op. cit., p. 364. See also, Hamilton, p. 240; Agnew, vol. i. p. 881.

[3] Hancock, op. cit., p. 509.

[4] Gerster, op. cit., p. 496; Hamilton, op. cit., p. 616; Hancock, op. cit., p. 539; Stokes, Lancet, 1842–3, vol. ii. pp. 621, Humphry, op. cit., p. 415, etc. etc.

tracted belly of the muscle. In other cases, the whole muscle is flabby and relaxed. As I have said, these cases are comparatively numerous; they may as a class be illustrated by the accompanying cut (Fig. 11),

Fig. 11.

taken from a case reported by Dr. Hopkins (*Med. Times*, March 24, 1883), in which, during violent muscular exertion in a man 55 years of age, who had had for several months a chronic rheumatic trouble of the shoulder, something was suddenly felt to snap, and there was pain with partial loss of power in the arm. He was disabled for but a short time. The deformity, five weeks later, is figured in the cut, and was thus described: "The mass of muscle stood out prominently. Its upper border, irregular in outline and somewhat nodular, terminated abruptly in the depression which exists just below the inferior margin of the deltoid. The hard nodulated condition at this point was evidently caused by the contraction of unresisted muscular fibres on themselves, and on their tendinous coverings. The position of the muscle was changed, being below the middle of the arm rather than slightly above, as in health. The tendon of the short head could be clearly traced almost up to its origin at the coracoid process of the scapula, while that of the long head could not be felt to react at all beneath the fingers during forcible flexion and extension of the forearm, as it ordinarily can be."

It is possible that the case which I have thus related may be susceptible of some other interpretation; it is not one about which it would be judicious to dogmatize; surgical experience is amply convincing of the inevitable uncertainty which hangs about changes occurring beneath the skin, and especially in the neighbourhood of joints; surgical literature shows, and very aptly in this particular instance, that phenomena which at one time or to one mind seem susceptible of but one interpretation, at another

period or to other observers assume a widely different aspect. Yet the symptoms in this case, taken as a group, and viewed from the theory that an uncomplicated luxation of the tendon of the long head of the biceps took place, certainly seem sufficiently consistent with one another and with the facts of anatomy and physiology, to justify me in placing them in this shape before the profession.

222 S. 16TH ST., PHILADELPHIA.

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ARTICLE II.

## MULTIPLE CUTANEOUS ULCERATION.

By I. EDMONDSON ATKINSON, M.D., Professor of Pathology and Clinical Professor of Dermatology, University of Maryland.[1]

IN June, 1881, I was enabled, through the kindness of my friend, Dr. F. E. Chatard, Jr., to see a case of such unusual interest, that with his permission I made extended notes of its history and course. These I append in detail, partly on account of the almost unique character of the case, and partly because from them it will become evident that we had to do with a pathological process belonging to that most important, but as yet vaguely understood class, the "tropho-neuroses," and closely related to the rare and remarkable affection first described, in 1862, by Raynaud, as symmetrical gangrene.

CASE—June 11, 1881. Nina R., 28 months old, is the child of parents of mixed negro and white descent. She is the only issue of her mother by a second marriage, which dates back three years. Her mother has three other living children by her first husband. The youngest of these is now 18 years old. One child died 20 years ago of whooping-cough. During the first marriage there were two miscarriages many years ago; but there have been none since the present marriage. There is not the smallest evidence of syphilis in the parents, who are well-to-do people. Nina was born at full term and apparently quite healthy. She continued well until she was two years old, but was rather backward in teething, having only twelve teeth at that age.

On the day she was two years old she had sore mouth and throat, and was visited by a physician. The buccal cavity and throat soon got well, but the lips remained cracked and swollen, and bled freely when stretched, as in laughing and crying. At the end of a week another physician saw her, and speedily relieved these symptoms. She did not get perfectly well, however, and her attendant said she had a "slow intermittent," for which he visited her for three weeks or more, ceasing to call as she improved. He was soon called in again on account of what the mother describes as a "swelling of the stomach," which was relieved in eight or ten days. Soon after this, about eight or nine weeks ago, she seemed to be

[1] Read at the seventh annual meeting of the American Dermatological Association, held at Lake George, August 29, 1883.

attacked with itching all over the body. Her feet and hands swelled, and became dry and wrinkled. Upon the dorsal surfaces of the toes pimples appeared. Small vesicles soon succeeded these. Vesicles with whitish, watery contents appeared also upon the dorsal surfaces of the fingers. These ruptured and left deep ulcers with copious discharge. The hands, feet, toes, and fingers were thus attacked, and the ulcers that formed, originally of small superficial dimensions, but deep and covered with thick yellow pus, enlarged both in depth and surface, and became irregular in outline. Eight weeks ago diarrhœa set in, and has proved very intractable.

The child now began to waste and become fretful and feeble. Her mouth again became sore, and ulcers of small size appeared upon the mucous membrane of the cheeks, tongue, and gums, and the throat became swollen. The saliva, which flowed freely, seemed to irritate the skin of the lip. At this point a small ulcer appeared, which rapidly extended widely but superficially. This is now of irregular outline, and extends from the left side of the lower lip stretching toward the right and involving a surface that reaches half-way to the ear and nearly to the level of the eye. It is not, and has never been, deeply excavated, nor has it discharged freely until the last few days. During this time it was difficult to ascertain the nature of the subjective symptoms. The affected parts evidently greatly annoyed the child. She would bite or rather gnaw them until they bled, and would rub them with her fingers until her hands were covered with blood. She would bite parts where no lesions were visible, as well. From the descriptions, it is difficult to decide whether this biting and rubbing were done to allay itching or on account of diminished sensibility of the parts. The extent to which bleeding could be excited without eliciting expressions of pain, would rather tell in favour of the latter condition. Ulcers similar to those upon the hands and feet developed upon the arms, and those upon the latter situations became worse about seven weeks ago. Ulcerations also made their appearance upon both legs near the malleoli.

She now remained without important change in the character of the ulcers, which remained inactive until about three weeks ago, when she was first seen by Dr. Chatard, to whose courtesy and intelligent observation I am indebted for the remaining history until the date of my own observation. During this period the teeth have appeared rapidly. She has cut eight since the beginning of her illness.

Dr. Chatard's treatment was addressed especially to the diarrhœa, which was plainly draining the strength of his patient, and, as this improved, the ulcers began to amend.

During the past two weeks, however, some new and very destructive ulceration has developed. The forefinger of the right hand, which had been excoriated by the teeth, began at this time suddenly to ulcerate at its second joint. The destruction of tissue, while not resembling gangrene, constituted so rapid a molecular disintegration that the tissues seemed literally to melt away, and by the second day the phalanx was laid bare, loosened from its attachments, and thrown off. In another twenty-four hours the terminal phalanx underwent a similar process. By the third day, the whole dorsal surface of the fingers was stripped from the bone. The destruction of tissue extended as far as the metacarpo-phalangeal joint, the tissues softening down into a yellow, greasy, purulent substance. Similar ulcerations, beginning with the formation of blebs with bloody contents, de-

veloped at the same time upon several of the toes and upon the right thumb, but have not advanced with the same celerity. It was at this time that Dr. Chatard's kindness gave me the opportunity of examining the case.

I found her emaciated and feeble, unable to stand, fretful, but apparently suffering but little pain. There was no febrile movement, though, during the attack, it was said to have been pretty constantly present. The tongue was enlarged, furred, and irregularly covered with small, inactive, superficial ulcerations. She continually rolled it about her mouth and projected it between her teeth. The gums and buccal mucous membrane were not ulcerated, and the teeth were firmly fixed in the jaw. There was no sponginess of the gums. The ulcer upon the face was unexcavated, smooth, red, secreting a scanty pus, and beginning to granulate at the edges. On the dorsal and flexor surfaces of the right wrist were ulcers of irregular jagged outline. These were as large as dime pieces, and were dry, pale pink, covered with a thin film, and absolutely inactive. Most of the small ulcers upon the fingers and hands were healed, leaving some infiltration and desquamation. Over the radial surface of the right wrist, which had been bitten, there was an ulcer, 5 cm. by 2.5 cm. in diameter, covered with a pale membrane-like, yellow deposit, slightly excavated and very inactive. Where granulations were visible, they were very pale. Upon the dorsum of the left thumb, involving the last phalanx, was a longitudinal ulcer, covered with a thick, yellow, fatty-looking deposit. This ulcer was quite deep. Upon the index finger, where the destructive ulceration began two weeks ago, the whole dorsal surface, as far as the metacarpo-phalangeal joint, was involved. The first phalanx protruded from the stump, and rested throughout its length upon a cushion of pale, inactive granulations, bathed in thin, yellow pus. For several days the ulceration had ceased to advance. There were no ulcers upon the arms, trunk, or thighs. Over the right external malleolus was the scar of an ulcer recently healed. Upon the right foot the ulcers had healed, leaving infiltration and desquamation. Those upon the left foot were in the same inactive condition as those upon the left hand. Upon the tip of the great toe was a circular ulcer, with a pale pinkish, smooth surface, and a scanty, yellow deposit. It was very inactive. Over the joint of the little toe was a similar ulcer.

The little patient seemed to have no sensation of pain in the affected parts, and, unless controlled, rubbed the raw surfaces with her hands until covered with blood. She likewise bit and gnawed her fingers and wrists without any expression of pain. A considerable degree of pinching seemed not to be painful. There was no anasarca. The heart was perfectly healthy. The urine was without sugar or albumen. Diarrhœa, though not so profuse as formerly, persisted to a slight extent. Whatever improvement was noticeable was said to have taken place during the past three weeks. Before that there had been no healing whatever.

Under attention to the general health and a wisely-selected diet, the child from this time improved, and in six weeks cicatrization was complete. Her nutrition improved, and she shortly became strong and vigorous. She is now (July, 1883) stout and hearty, though the scars of the old ulcers are abundantly present. A superficial scar extends over the chin and right cheek, extending obliquely upward and backward 9 cm., and vertically 6 cm. It has drawn the angle of the mouth slightly to one side, and gives a somewhat sinister expression to the countenance. Upon the dorsal and radial surface of both wrists are several large scars.

There are also scars upon the dorsal surface of the left thumb and index finger. Of the index finger there remains only the stump of the first phalanx. All the other fingers of both hands are intact, with perfect nails. There are scars just above the right ankle, externally and superficially, and upon the dorsal surfaces of the right toes, though the nails remain intact. Scars are also upon the dorsal surfaces of the left toes, and the nails of the great, second, and little toes are in great part destroyed. The child's general health is perfect and all its organs, as far as can be ascertained, in excellent condition.

As causes of this remarkable morbid condition, we may exclude mercurial intoxication and that from ergot or other medicaments which occasionally excite gangrene or destructive ulceration in those into whose bodies such agents have been introduced. Of ergot, it could not be ascertained that she had taken any. There was, possibly, a minute quantity of ammoniated mercury in an ointment she had employed, but symptoms of mercurial poisoning were not present. We may also reject diabetes mellitus as a possible cause of the symptoms. It was impossible to attribute the lesions to scurvy, for the child was most favourably situated as far as healthful lodging and food were concerned; and furthermore, the symptoms presented were not of the latter affection. To determine the true relations of the infrequent disease I have described, it will be necessary to briefly recapitulate its symptoms.

These were, first, a papulation and vesiculation, followed by a very superficial destruction of the epidermic structures and most external dermal tissue. This was followed, more or less rapidly, by ulceration of a progressive character, so that, in the highest degree, in a very short time, not only muscle, fibrous tissue, and cartilage, but even bone was destroyed. At no point was there gangrene in mass, if we may exclude the secondary destruction of bone, but, on the other hand, rapidly progressive molecular gangrene. This ulceration, while showing a tendency to affect similar parts of corresponding members and regions, could hardly be termed symmetrical. The right side of the face suffered much more severely than the left, while the left upper and lower extremities were decidedly more affected than those of the right side.

The extent to which motion and sensation were impaired was indeterminate. The child lost the power of locomotion, but whether from diminished nerve influence directly, or from increasing general debility, was not evident. Certainly there was no complete paralysis. Similarly with sensation, it was difficult to determine the true condition. That there was abnormal sensation was certain, but whether there was itching or paræsthesia was a matter of doubt. There were no scratch marks, nor was any expression of pain elicited upon handling the parts. On the other hand, there can be no doubt that the sensation of pain was decidedly blunted, as shown by insensibility to quite rough usage, and by the violence with which the child bit and rubbed her extremities, even to the production of

lesions and the copious discharge of blood. This bluntness of sensation extended beyond the area of lesions, and amounted to a decided numbness. Distinct symptoms of vaso-motor disturbance were not observed; the description of the mother, however, that the extremities became dry and wrinkled, is of significance, though it must be admitted that this was not observed by Dr. Chatard and myself The colour of the child's skin would also doubtless interfere with the recognition of vaso-motor phenomena.

Though I have never encountered a similar case, I think there can be no doubt that this one belongs more directly to the group of affections which the late Oscar Simon first named "multiple cachectic gangrene." (*Breslauer ärztlische Zeitschrift*, No. 1, 1879.) This affection, according to the author quoted, attacks, almost exclusively, children between one and two years old, and begins with vesicles which dry into scabs. These fall off and leave a loss of substance of varying depth, in some cases even reaching to the bone. In all cases, cachexia may be recognized. (In two cases congenital syphilis was present.) Simon regards the process as a gangrene produced by a cachectic thrombosis. It is not unlike the forms of gangrene produced by ergot, morphia, or in the course of diabetes, typhus, or in paraplegics. The prognosis is good. The treatment should be principally of a tonic character.

Eichoff (*Deutsche med. Woch.*, No. 34, 1880) has recorded a case agreeing in its essential characters with the description of Simon, and yet having resemblances to my own case that would denote a close relationship.

His case, the interest of which will justify the rather extensive use I make of the abstract in the *Vierteljahrschrift f. Derm. u. Syph.*, 1880, p. 867, was a three-year-old girl, who had had an extensive eczema. The child's parents lived in the country, but being poor were unable to supply the necessary care and attention after its recovery from this complaint, and it gradually became more feeble, until a new attack of illness caused it to be brought to the clinic a month later. A few days previous to its admission, a considerable number of dark-red spots, varying between pinheads and beans in size, developed upon its back. At these spots, vesicles with serous contents quickly formed. These soon coalesced and became ulcerous. A gangrenous appearance was next assumed, and in a couple of days black sloughs were formed. After the removal of these sloughs, ulcers appeared with steep borders, which often extended deeply into the subcutaneous connective-tissue. Under appropriate simple treatment these ulcers healed, leaving variola-like scars. A few days after admission a corneal ulcer had appeared, with conjunctival irritation, pain and photophobia, and at the same time gangrenous ulcers appeared upon the scalp, and pursued the same course as those upon the back; from dark-red spots to vesicles, then ulcers covered with black sloughs, then fresh granulations, and, finally, depressed scars. Under tonics, in a fortnight, most of the ulcers had healed, a few remaining on the buttocks and scalp. At the end of two more weeks there was a relapse, during which gangrenous ulcers, larger and more numerous, appeared upon the scalp, which was covered with bean-sized ulcers with sharp borders, foul deposit, and ill-smelling secretions. An ulcer of the left cornea also appeared. Behind each ear the ulcers were more than an inch long. This exacerbation was accompanied by fever, which lasted a week, after which gradual improvement was noted, and the child was discharged, nearly well, three weeks later.

The only other case that I have been able to identify, as presenting close similarities with my case, was reported by Cæsar Boeck (*Norsk Magazin. f. Laegevideuck.* Heft 10, 1881; *Viertelj. f. Derm. u. Syph.*).

This patient was a little girl ten months old, and well nourished. Upon her back, breast, scalp (especially the vertex), and upon the flexor surface of the arm and forearm, were a mass of closely arranged efflorescences in different stages of development. At the same time there were numerous scars of various sizes and depth, closely resembling pockmarks. The history of the different lesions was as follows, viz., each lesion began with a somewhat elevated spot, which quickly formed a white vesicle. This seeming vesicle or little bleb had no cavity, however, but consisted mostly of swollen and softened epidermis, so that when it was destroyed only a minute amount of serous fluid could be detected. When the vesicle attained a certain size, it began to flatten and sink in the centre, where a brown crust began to form. There was thus presented a striking resemblance to a vaccine pustule of the ninth or tenth day. This crust soon covered the entire lesion. As it began to loosen, a more or less deep gangrene became evident. The slough was thrown off by a profuse suppuration. Upon the scalp this gangrene involved the periosteum, so that superficial necrosis of the bone resulted. After the removal of the slough there remained quite deep ulcerations with sharp undermined edges, which healed with slow granulation. In the axillæ the ulcers were very deep, extending into the subcutaneous tissue. The lesions were most extensive upon the scalp, where, at the time of writing, several scars measured from one to two cm. in diameter. The course of the affection was slow, in consequence of the frequent occurrence of new lesions. The disease had first shown itself about six months previously upon the right cheek, as a single, but extensive lesion, the recently healed, discoid, deep scar of which remained, about one cm. in diameter. About a fortnight later, the disease attacked the scalp and back, and slowly spread to all the mentioned localities. The disease had by no means shown so perfect a symmetry that one could attribute it, with confidence, to altered nerve influence. In the scanty serous secretion from the freshly formed vesicles, were formed numerous micrococci, which, however, did not differ from the common micrococci to be found in nearly all cutaneous centres of inflammation. The author attributed no special significance to their presence. Boeck could not, however, adopt Simon's theory of a cachectic thrombosis of the cutaneous vessels as the cause of the lesions. The little patient could be called neither cachectic nor marasmic, and her condition of life was, upon the whole, good.

At the time this patient was treated, there was another case of the same disease in the out-patient department of the University Clinic. This was a girl, one year old, much reduced and cachectic. This child had as in Eichoff's case, a phlyctenular keratitis. It was affected with the disease during many months.

It is impossible not to recognize a relationship between these cases and the one I have given, although in the latter gangrene in mass did not occur. This difference would mark, however, variation in intensity only, the gangrene in the least intense case being molecular in character. It is likewise impossible to avoid the conclusion that these cases form one extreme of a series of morbid processes of which the symmetrical gangrene of Raynaud constitutes the other. Since 1862, this affection has attracted some attention, though but a limited number of cases of it have been reported. It has received notice in France from Brehier (*Thèse de Paris*, 1874), Mougeot (*Thèse de Paris*, 1867), Foulquier (*Thèse de Paris*, 1874),

a second time by Raynaud (*Arch. Gén. de Paris*, 1874), Déjérine and Leloir (*Arch. Gén. de Physiol.* 1881, No. 6), and others; in Germany, from Estlander (*Arch. f. klin. Chir.* 1870, xii. 453), Hastreiter (*Wiener med. Presse*, 1882, No. 33), Rinecker, Nedophil, Fischer, Englisch, and other writers, more especially by Weiss (who has made it the subject of a double number of Schnitzler's lectures), and from a number of others in different countries. The characters of the malady are admirably given in synopsis by Weiss, who says (Ueber symmetrische Gangrän, *Weiner Klinik.*): "by 'symmetrical gangrene' is understood a neurosis of the central nervous system, the anatomical basis of which has not yet been discovered, which is manifested, clinically, by numerous vaso-motor, trophic, and sensory disturbances as well as by alterations of the nerves of special sense, and which involves symmetrical (for the most part) portions of the hands and feet (phalanges), more rarely other regions of the body, in gangrene of a peculiar character." I am again indebted to Weiss for a synopsis of the case that served Raynaud for a type of the disease, and which I may be allowed to reproduce, as it will serve for an admirable contrast and comparison with the cases already related.

It was as follows:—

"A woman, twenty-seven years old, who had menstruated regularly since her fourteenth year, experienced four months after her first confinement (February, 1859) paræsthesia of the fingers. Pain soon developed in them, and in a few days increased in intensity, so as to destroy the night's rest in spite of the use of laudanum. Several fingers became 'numb,' and later the terminal phalanges became of an intensely dark colour. The tip of the nose also became black at the same time, without becoming painful. By the end of March a similar change appeared in the feet. The toes grew painful, and the terminal phalanges black. In the beginning of April the dorsal surfaces of the end phalanges and the pulps of the fingers developed pin-head sized sloughs, and upon the dorsal surfaces of the three middle toes, the epidermis was raised in blebs containing bloody serum, which gradually dried into black scabs. Later on the same process involved both great toes. A small slough also appeared upon the buttock; while upon the fingers the gangrene remained limited to the superficial layers of the cutis, and did not spread; that upon the toes spread so much in surface and depth, that by the beginning of June the end phalanges of the four first toes of both feet had sloughed, so that when the line of demarcation was established at the second phalanx they hung from the healthy parts like charred bits. The necrotic parts were removed, and healing quickly followed. The pulse throughout the disease showed no abnormality; the heart was normal; the temperature was always normal; the urine contained neither sugar nor albumen. The patient had only once taken ergot (1.50 grams after her confinement). She remained healthy after recovery without a relapse."

This symmetrical gangrene is usually associated with various vaso-motor disorders, spasm of the small arteries, occasioning anæmia; of the small veins, giving rise to passive hyperæmia; or by implication of vaso-motor centres paralytic hyperæmia, as well as by disturbances of general nutrition of various degrees.

While, however, there seems to be but little doubt that all these disorders have a more or less similar genetic history, it remains a matter of

the greatest difficulty to determine the definite pathological process upon which they depend.

Dégérine (*Le Progrès Méd.* 1882, No. 6) studied changes in sloughs, depending upon determinate alterations in the central nervous system. He examined, one hour after death, portions of skin affected with gangrene from a case of cerebral hemorrhage, and from one of sclerosis in patches. He found parenchymatous neuritis affecting all the nerve tubes, both nearest the slough, and as far as from 7 to 8 cm. above it. This author, together with Leloir (*Archives de Physiologie*, 1881, p. 1011), claims that "the eschars result from a profound alteration of the trophic influence exerted by the nervous system over the nutrition of the skin. Vaso-motor paralysis, compression, troubles of sensations, contact of the skin with urine, may play an accessory rôle in the production of eschars. The *cause* is parenchymatous neuritis (atrophic neuritis), with ordinary characters." And again, they say, "a peripheral primitive neuritis was the cause of the gangrene." The changes in the parenchymatous neuritis, they assert, depend "nearly always upon alterations of the trophic centres of nerves, or, what amounts to the same thing, an alteration affecting the continuity of these, and separating the subjacent extremity from the trophic influence."

While parenchymatous neuritis may account for the necrotic changes in cases such as served for the investigations of these authors, cases where gross lesions of the nervous system were discovered after death, or which were accompanied during life by nervous symptoms indicating profound and permanent alterations, it is exceedingly improbable that the class of cases we have been considering can have any such origin. They usually end in perfect recovery; they are never accompanied by gross lesions of the nervous system; they do not exhibit the symptoms of parenchymatous neuritis, usually quite recognizable.

It is also exceedingly improbable that either thrombosis or embolism can constitute a determining cause in the production of the symptoms, since, upon the one hand, there have been detected no centres whence emboli could have been derived, and, upon the other, in parts presenting so abundantly channels for the establishment of collateral circulation, it is difficult to imagine how a thrombosis capable of producing gangrene could occur *primarily*.

For the present, it would appear that these cases should be assigned a place in that already numerous class, the neuroses; though, whether they depend upon alterations in the vaso-motor system, or in that still indeterminate system of trophic nerves, cannot as yet be decided. One difficulty in the way of accepting the theory of trophic nerve influence has been, to some extent, surmounted by the suggestion that separate trophic fibres are not essential for the propagation of the impulse from trophic

nerve-centres, but that the ordinary nerve-fibres may serve as the medium of communication.

Mere spasm of bloodvessels, whether arterial and producing anæmia, or venous and producing mechanical hyperæmia, cannot be capable of producing gangrene, as is shown by the every-day experience that either of these conditions may persist for hours, and even days, and yet not bring about any tendency toward gangrene. It is possible, however, that a temporary interference with the nutrition of parts, from whatever cause, may occasion their death, if they are already enfeebled in their powers of resistance, whether from arrested trophic nerve influence or from lowering of their own intrinsic vitality. In this connection it is of interest to observe, that in many cases of non-traumatic gangrene the death takes place in parts subject to undue deleterious influences from without (the skin more especially), in individuals whose sources of nutrition have undergone deterioration, as in typhoid fever, etc.

In the absence of definite knowledge, however, of the pathogenesis of these and kindred lesions, and in view of the unmistakable vaso-motor disturbances observable in the more pronounced forms of the affection known as symmetrical gangrene of Raynaud, we can do no better than provisionally accept the very lucid theory of Weiss, according to whom the disease is a neurosis, in which the vaso-motor centre is, from whatever cause, readily thrown into a state of hypertonus; the importance of the symptoms depending upon the dignity of the parts upon which the vascular spasm is developed. Contraction of the cutaneous arteries will produce a bloodless condition of the skin. By venous spasm is produced local cyanosis, and by contraction of vaso-dilators local active hyperæmia. Similarly, by vascular spasm of those portions of the posterior columns standing in functional relation with the skin, will be produced nutritive disturbances of the skin and epidermic structures (loc. cit., pp. 391–392).

In giving this article a title, I have retained the term "cachectic," as originally proposed by Simon, for "multiple cutaneous gangrene," in order that the relationship of the cases should be kept in mind. It is by no means certain, however, that any condition of cachexia, as ordinarily understood, is necessarily present.

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## ARTICLE III.

### THE VISUAL AREA IN THE BRAIN DETERMINED BY A STUDY OF HEMIANOPSIA.

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RECENT research in cerebral physiology has been directed toward the subject of the localization of sensory areas on the cortex of the brain, and

has been productive of many very interesting discoveries. The investigations of Wernicke and Stilling in the anatomy of the brain, and the observations of numerous pathologists in cases of hemianopsia have confirmed in such a striking manner the conclusions of the physiologist, Munk, regarding the cortical area governing vision, that a summary of the facts deserves attention. A knowledge of these facts is necessary both for the exact examination of cases and for an accurate record of autopsies; as it seems probable that many errors in the past have been due to the imperfect investigation of symptoms and of lesions.

The experiments of Munk, first announced in 1878,[1] awakened so much criticism that he deemed it necessary to repeat them, especially as they differed in their results from those of Ferrier.[2] In 1881 a second series of researches was reported by him confirming his first conclusions,[3] while in the same year Ferrier was led by further experiments to modify his earlier statements,[4] and to bring them more nearly into accord with those of the German physiologist. At the recent July meeting of the Physiological Society of Berlin (1883) Munk made a final statement summing up the result of the work of the past seven years,[5] and demonstrating the accuracy of his conclusions. These may be stated as follows:—

"1. The occipital lobes of the brain are necessary for the perception of visual impressions. Destruction of both occipital lobes produces total and permanent blindness.

"2. Each occipital lobe is in functional relation with both eyes in such a manner that corresponding halves of both retinal areas are projected upon the cortex of the lobe of the like-named side; *e. g.*, destruction of the left lobe produces loss of function of the left halves of both retinæ.

"3. On the cortex of each occipital lobe the anterior segment corresponds to the upper half of the retinæ; the posterior to the lower half; the external half to the temporal half of the eye of the same side, and the internal half to the nasal half of the eye of the opposite side. Even though ever so small portions of the sections of the cortex in question were removed the corresponding part of the retina would be rendered blind. In time the animal learns to make up for the defects caused by operations, and with the remaining unaffected parts of the retina will contrive to see so well and act in general in such a way as to superficial observation to convey the impression of an animal endowed with normal powers of sight. On close examination, however, of the particular parts of the retina it will be found in every case that the part corresponding with the excised part of the cortex is blind. Functional restoration of an excised part of the cortex never occurs."

It is not necessary to give in detail the method pursued in reaching these conclusions. It may be stated that the animals experimented upon were dogs and monkeys, and that the results in both led to the same conclusions; it being found, however, that, as in dogs, the majority of the optic fibres decussate at the chiasm, each occipital lobe was in closer functional

[1] Verhandl. d. Physiol. Gesellsch. zu Berlin, 1878–79, Nos. 4–5.
[2] Ferrier, Functions of the Brain, 1876, pp. 164–171.
[3] Verrichtungen des Gehirns, Berlin, 1881.
[4] Cerebral Amblyopia and Hemiopia, Brain, Jan. 1881.
[5] See Report in Nature, Aug. 30, 1883.

relationship with the eye of the opposite side than in monkeys, whose optic decussation resembles that of man in being partial. A strong point in support of these conclusions is drawn from the fact that Munk kept his animals alive for from one to five years after the operation, watching them carefully for signs of recovery, and distinguishing the temporary effects of the operation from the permanent effects of the lesion. He thus escapes the criticism which is rightly urged against the experiments of Ferrier by Goltz. The large number of animals used, the uniform result of the experiments in all cases, the length of time during which the symptoms persisted, and the minute care displayed in the observations combine to establish the truth of the conclusions reached.

It remains for the pathologist to determine whether these facts, which are true in the case of monkeys, are true also in the case of man. Nature's experiments in the form of disease, when carefully studied, supply the necessary conditions and facts to determine this question. During the past four years a large number of cases have been reported with full records of autopsies, which are of great value in establishing the fact that the function of vision in man is performed by the occipital lobes of the brain. Before examining these cases, however, a brief review of the anatomy of the optic tract may be of service, in order to call attention to a recent discovery of Wernicke.

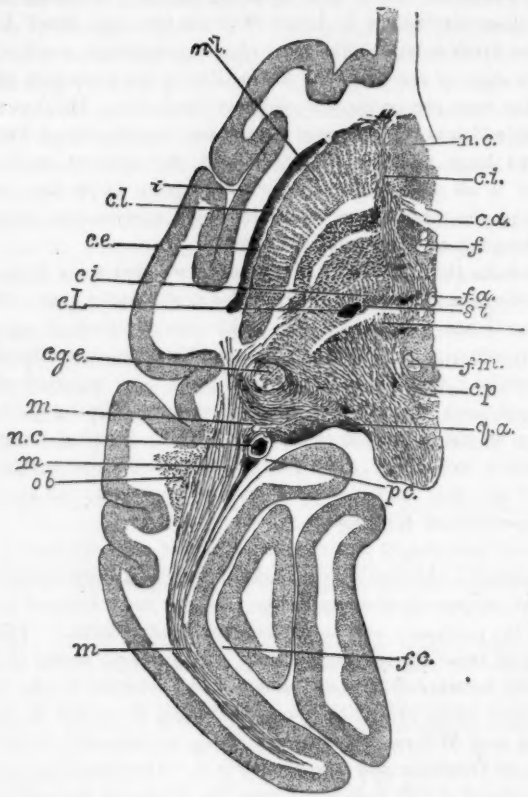
It has long been taught that the decussation of the optic nerves in the chiasm is partial; and that the optic tracts, beginning at the chiasm, terminate in the corpora geniculata, in the posterior *outer* third of the optic thalamus (the pulvinar), and in the corpora quadrigemina.[1] The direct connection of these central ganglia with the cortex by means of a white tract passing outward from the thalamus and backward to the occipital lobe has been lately proved by Wernicke.[2] His discovery is confirmed by Stilling and Wilbrand, and is a striking confirmation of the earlier statements of Gratiolet and Meynert, Fig. 1. It is therefore possible to follow the course of the optic fibres from the chiasm to the occipital lobe. This course is further corroborated by a case reported by Huguenin,[3] in which, after blindness of the left eye of fifty years' duration, both occipital lobes were found to be atrophied. The atrophy consisted of a diminution both in the size of the convolutions and in the thickness of their cortex, and was greater in the right hemisphere. The test of pathology thus establishes the existence of a direct anatomical connection between one eye and both occipital lobes. Several cases of atrophy of both occipital

[1] The existence of fibres from the optic tract to the pons and olivary body—the radix descendens nervi optici of Stilling—is still under examination. It is uncertain whether the fibres passing from the tract to the basal optic ganglia of Meynert and to the corpora Luysii are connected with sight.

[2] Wernicke, Gehirnkrankheiten, Anatom. Theil. 1. pp. 79–85, 1881.

[3] Nothnagel, Topische Diagnostic d. Gehirnk, p. 476.

Fig. 1.




HORIZONTAL SECTION OF A BRAIN OF A MONKEY. (After Wernicke. $\frac{1}{1}$.)

*n. c.* Nucleus caudatus; *c. i.* capsula interna; *f.* fornix; *f. a.* fornix ascendans; *c. a.* commissure anterior; *c. p.* com. posterior; *s. l.* bundle of fibres from *n. l.* to the tegmentum; *f. m.* Meynert's bundle; *q. a.* corp. quadrigemina ant.; *p. c.* posterior cornu of lateral ventricle; *f. c.* fissura calcarina; *o. b.* crosscut fibres to lower occipital lobe; *m.* direct medullary fibres to occipital lobe; *c. g. e.* corp. genic. ext.; *c. l.* corpus Luysii; *c. e.* capsula externa; *c. l.* claustrum; *i*, island of Reil.

lobes after total blindness of long duration are on record.[1] It would therefore appear to be a matter of anatomical necessity that impressions received in each eye should be conveyed to both occipital lobes of the brain.

But pathology furnishes even more convincing proof of the functional

[1] Nothnagle, Topische Diagnostic d. Gehirnk, s. 389. Griesinger, Hirnkrankh. s. 365. Moore, Jahresbericht v. Virchow, xiv. i. 91. Mickle, Med. Times and Gaz., 1882, Jan. 28; in this one alone were the angular gyri also involved.

connection of the occipital lobes with vision. The peculiar symptoms of blindness in the corresponding halves of both eyes, called "lateral homonymous hemianopsia," was long thought to be due in every case to a destruction of one optic tract.[1] Prior to five years ago all the cases on record supported this conclusion. Since that time numerous cases have been published which demonstrate that it may also be produced by a lesion of the pulvinar of one optic thalamus, or by a lesion of one occipital lobe, situated either in its white matter (*i. e.*, in the direct tract of Wernicke) or in its cortex. They also prove that each occipital lobe is in functional connection with both eyes, and not with the eye of the side opposite to it only, as has been formerly supposed. No summary of these cases has appeared in English. In order to demonstrate their value in determining the visual area of the brain they are cited here; only those cases being given which are accompanied by a record of autopsy.

I. *First Group. Hemianopsia with Lesion of one Optic Thalamus.*

CASE 1. Male, æt. 62. Left hemianopsia; field of vision limited by a vertical line passing through the fixation point. No other symptoms.

*Autopsy.*—Hemorrhage in the posterior part of the right optic thalamus, and in the corpus striatum. Optic tracts normal. (Pflüger; Augenklinik in Bern, 1878, cited by Marchand. *Graefe's Archiv für Ophthalmologie*, xxviii. 2.)

CASE 2. Male, æt. 75. Left hemianopsia; field of vision limited by a line passing vertically through the fixation point. Other symptoms: left hemianæsthesia and hemiparesis. Symptoms all remained three years.

*Autopsy.*—Area of softening with atrophy, limited strictly to the posterior half of the right optic thalamus, and destroying the pulvinar. All other parts of the brain, including the optic tracts, normal. (Hughlings-Jackson, *Lond. Ophthal. Hosp. Rep.*, viii.)

CASE 3. Male, æt. 50. Left hemianopsia coming on suddenly, and associated with aphasia, left hemiplegia and anæsthesia of left arm and leg. The loss of vision in the left half of both fields of vision was complete, and was limited by a vertical line passing just to the left of the point of fixation. Central vision good. Pupils normal. The aphasia disappeared, but the hemiplegia increased in degree until death, two weeks after the attack.

*Autopsy.*—Oval clot 4 x 3 x 3 lines was found in the posterior and upper extremity of the right optic thalamus, quite within the pulvinar. Corp. quad., corp. genic., and optic tracts normal. Three other small hemorrhagic spots were found in the right centrum ovale in the course of the motor fibres passing to the central convolutions. These were the cause of the hemiplegia, while the hemianopsia was due to lesion of the thalamus. (Dreschfeld, *Brain*, vol. iv., No. 4, p. 549.)

CASE 4. Male, æt. 55. Right hemianopsia; field of vision limited by a vertical line passing through the fixation point. Other symptoms: paresis of entire right half of body; anæsthesia of right arm; disturbance of speech; epileptiform convulsions and mania. Death after seven months.

*Autopsy.*—Tumour (gumma) in the left occipital lobe, surrounded by a very extensive zone of softening which involved the parietal lobe, and extended inward to the left optic thalamus, which was softened. Optic chiasm and tracts normal. (Pooley, *Knapp's Archiv. of Ophthal.*, vi. p. 27.)

CASE 5. Male, æt. 42 Right hemianopsia; central vision good. Other symptoms: aphasia; right complete hemiplegia, with facial paralysis.

*Autopsy.*—Tumour in left occipital lobe surrounded by a zone of softening reaching inward to and involving the pulvinar of the left optic thalamus. Optic tracts normal. (Hirschberg, *Deut. Zeitsch. f. Prac. Med.*, 1878, No. 4.)

[1] This error is reaffirmed by A. L. Ranney, M.D., N. Y. Med. Record, Aug. 18, 1883.

The last two cases would be placed in our second group, did not both Pooley and Hirschberg refer the hemianopsia to the lesion of the optic thalamus.

II. *Second Group. Lesions of the Occipital Lobe.*

CASE 1. Male, æt. 64. Right hemianopsia with right hemiplegia and aphasia. *Autopsy.*—An embolus in the left sylvian artery had produced an area of softening in the left hemisphere, involving the corpus striatum, external capsule, and centrum ovale. An area of softening was also found in the anterior part of the left occipital lobe in its white substance. Island of Reil, optic tracts and chiasm normal. (Förster, cited by Grasset; *Montpellier Medical*, Feb. 1883.)

CASE 2. Female, æt. 46. Right hemianopsia, limited by vertical line through fixation point. Other symptoms: aphasia; complete right hemiplegia with anæsthesia, following a sudden loss of consciousness, with right unilateral convulsion. Patient lived three months after.

*Autopsy.*—Embolus in the left sylvian artery, with softening of the area supplied by it, viz., the posterior part of the inferior frontal; the inferior part of both central; the anterior part of the gyrus supra marginalis and the island of Reil. The area of softening extended inward to the nucleus lenticularis, and backward into the white matter of the parietal lobe. (Huguenin, *Ziemssen's Cyclop.*, xi. p 797.)

The area of softening probably reached the direct medullary tract of Wernicke lying beneath the supra-marginal gyrus at its posterior extremity, and thus produced the hemianopsia in both of these cases.

CASE 3. Right hemianopsia occurring suddenly, with headache and drowsiness. Later aphasia developed.

*Autopsy.*—In the left hemisphere a hemorrhage had destroyed the greater part of the corona radiata, including the posterior fibres to the occipital lobe, and had penetrated into the parietal lobe, nearly reaching the island of Reil. Other parts of the brain normal. (Dmitrowsky, cited by Wilbrand, *Hemianopsie*, p. 477.)

CASE 4. Female, æt. 69. Sudden attack of complete right hemiplegia, with anæsthesia, including the face, followed by left hemichorea of both arm and leg, which persisted during sleep, and left a hyperæsthesia. The left eye had long been blind from pannus, but a lateral right hemianopsia of the right eye accompanied the apoplectic attack. The hearing was diminished in the right ear. Patient was very stupid, but lived 32 days after the attack.

*Autopsy.*—The entire left occipital lobe, the parietal convolutions, and the central convolutions were softened from embolism of the art. fossa. syl. and the art. med. sinist. The basal ganglia and the internal capsule, in its entire extent, were included in the softened area. (Birch-Hirschfeld, cited by Vetter. *Deut. Arch. f. Klin. Med.*, xxxii. 507.)

CASE 5. Female, was suddenly seized with amnesic aphasia, without any affection of motion or sensation. Smell and taste were normal, but she no longer looked directly at objects or persons, but constantly kept both eyes turned to the left, there being, however, no paralysis of the ocular muscles. In grasping things to the right of her she would miss them, and have to correct herself by turning her head, in order to see them. Ophthalmoscopic examination negative. The author attributed the position of the eyes to right hemianopsia.

*Autopsy.*—Embolism of the parieto-sphenoid branch of the left sylvian artery. The entire left lower parietal lobule was softened, especially in its cortex, and the softening encroached upon the cortex of the second occipital convolution to a considerable extent. (Fritsch, cited by Wilbrand, *Hemianopsie*, p. 144.)

CASE 6. Male, æt. 50. Right hemianopsia. Other symptoms were aphasia, complete loss of muscular sense in the right arm, and attacks of right unilateral convulsions which left the patient hemiplegic for a few days, after which he would regain his power in the right side. Death occurred several months after.

*Autopsy.*—The pia mater was adherent over the entire left hemisphere, and the cortex was in a condition of yellow softening, and was atrophied in the entire parietal, in the greater part of the occipital, and in a portion of the temporo-sphenoidal regions. The angular gyrus was less involved than the other parts. Westphal refers the hemianopsia to the lesion of the occipital lobe. (Westphal, *Charité Annalen*, 1882. *Brain*, July, 1882, p. 281.)

CASE 7. Hughes reports a case in which, after a compound fracture of the skull in the occipital region, two pieces of bone were elevated and removed on the left side. There was much laceration, and some loss of brain-substance in this region. The patient recovered, but a right hemianopsia remained. Cited by Wilbrand. *Hemianopsia*, p. 142.)[1]

CASE 8. Male, æt. 64. Right hemianopsia, limited by a vertical line passing 5° to the right of the fixation point. To the right of this line was a zone 10°–15° broad in both eyes, in which perception of light was possible, though much impaired. The periphery of the visual field of the left eye was narrowed about 5°–10°. This condition continued twenty months, during which the degree of the hemianopsia varied somewhat, the width of the vertical zones of indistinct vision and the peripheral defect in the left eye at times decreasing and then recurring. The limiting line did not change its position. Other symptoms were at first agraphia, aphasia, and alexia, of which the first only had disappeared at the time of death. Toward the close of life, a right hemiplegia developed gradually, affecting the arm more than the leg.

*Autopsy.*—A softened area on the cortex of the posterior part of the left hemisphere involved the occipital, parietal, and temporal convolutions, at their junction, two-thirds of it being located in the occipital cortex, upon the convexity. The area was irregular in outline, and did not destroy the angular gyrus. The centre of the convexity of the occipital lobe was its principal seat, but the convolutions joining the occipital lobe with the second temporal and inferior parietal, as well as the posterior parts of both these convolutions, were involved. The softening extended inward through the white substance, and reached the ependyma of the post. cornu of the lateral ventricle, thus involving the direct medullary tract of Wernicke for a breadth of two cm. A second area of softening in the external capsule encroached on the nucleus lenticularis, and the anterior part of the internal capsule. In the white matter of the anterior central convolution were two more small centres of softening. A descending degeneration was followed from the internal capsule into the pons. Thalamus and optic tract normal. (Wernicke, *Gehirnkrankheiten*, ii. 190–195.)

CASE 9. Male, æt. 42. Right hemianopsia not quite reaching the point of fixation. Central vision good in both eyes. Ophthalmoscopic examination negative. Other symptoms: vertigo, loss of memory, aphasia, and partial agraphia with temporary right hemiplegia.

*Autopsy.*—In the left occipital lobe, involving all three of its convolutions, as well as the præcuneus, was found a gelatinous sarcoma. A wedge-shaped area of softening extended inward through the white substance to the posterior cornu of the lateral ventricle. Thalamus and optic tracts normal. (Jastrowitz, *Arch. f. Augenheilkunde*, 1877, p. 254.)

CASE 10. Male, æt. 51. Right hemianopsia limited in the left eye by a line passing through the point of central vision, and in the right eye by a line passing 10° to the right of this point. Ophthalmoscopic examination negative. Other symptoms: monoplegia of the left arm, with vaso-motor paralysis. The paralysis was referred to a loss of the muscular sense. No disturbance of sensibility but paræsthesiæ of the entire arm. Gradual development of a condition of dementia and apparent increase of the degree of blindness, the extent of which could not be determined, on account of the mental condition of the patient. Death after two months.

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[1] A similar case is reported by Nieden, Graefe's Arch. f. Ophthal., xxix. p. 143. The case of Keen and Thompson, Surg. Hist. of the War, I. 270, is without autopsy, and the course of the ball was too indefinite to warrant any conclusion as to the lesion.

*Autopsy.*—The entire left occipital lobe as far forward as the sulcus parieto-occipitalis, both on its surface and in its substance, was found in a condition of yellow and grayish-white softening. A second area of softening, involving the middle third of the right anterior central convolution, explained the monoplegia. Two other small areas of softening were found in the right hemisphere: one in the superior parietal lobule; the other in the third occipital convolution. A recent hemorrhage in the right optic thalamus was the cause of death. Optic tracts normal. (Nothnagel, *Topische Diagnostic d. Gehirnk.*, p. 390.)

CASE 11. Male, æt. 45. Right hemianopsia. Other symptoms developed later were right hemiparesis with anæsthesia going on to complete hemiplegia. Fever and headache. Diagnosis was made of an abscess in the left occipital lobe. The left parietal bone was trephined at its post. sup. angle; the abscess was found and evacuated, with temporary relief of the hemiplegia. The hemianopsia remained till death, two weeks after the operation.

*Autopsy.*—In the left occipital lobe involving also the posterior part of the inferior parietal lobe was found an abscess of tubercular origin with ragged walls. On the convexity of the left occipital lobe numerous tubercles were found embedded in the cortex. Optic thalami and tracts normal. (Wernicke u. Hahn., *Virchow's Archiv*, vol. 87, p. 335.)

CASE 12. Female, æt. 21. Right hemianopsia. Central vision good. Other symptoms: headache, dysarthria, anæsthesia of the right half of the face. No paralysis; no mental symptoms. Choked disks. Death after seven months.

*Autopsy.*—A cystic glioma was found in the left occipital lobe which had reached and destroyed the cortex of the lobe at its apex, and had extended inward nearly reaching the inferior cornu of the lateral ventricle. The entire inner half of the occipital lobe was thus destroyed. (Jany, Knapp's *Archiv f. Augenheilk.*, xi. p. 190.)

CASE 13. Female, after an apoplectic attack was unable to talk distinctly, was partly paralyzed in the right hand, and unable to perceive sensations in the right half of the body. She only saw one half of objects. This condition lasted two and a half years, when after a second apoplexy accompanied by total right hemiplegia she died of pneumonia. The hemianopsia continued till death.

*Autopsy.*—Membranes not adherent to the brain. On the median surface of the left occipital lobe there was a large area in which the brain substance was missing; and the lateral ventricle was separated from the pia mater only by a thickened ependyma to which debris of brain tissue was adherent. A cyst was found in the right superior lobe of the cerebellum. Other lesions of a more recent date were two small centres of softening in the left optic thalamus, and a small cyst in the left corpus striatum. (Chaillou, *Bull. d. l. Soc. Anat. de Paris*, 1863, Feb. *Procès Verbal.*[1])

CASE 14. Male, æt. 69, was admitted to la Charité Hospital, Berlin, four months after an attack of left hemiplegia with partial aphasia; when in addition to these symptoms and mental weakness it was noticed that the patient's eyes were constantly turned to the right, though the muscles of the eyes were not paralyzed. Examination revealed a left hemianopsia. Sensation on the left side could not be tested on account of his mental condition. Later ataxia and paresis of the right arm and leg developed, and febrile symptoms with delirium terminated in death six months after the attack.

*Autopsy.*—General atrophy of the convolutions. Arteries atheromatous. In the middle of the second right temporal convolution a discoloration was visible; and on section a large hemorrhagic spot of softening was found which had destroyed the greater part of the substance of the temporal lobe, and had extended backward into the occipital and upward into the parietal centrum ovale without

[1] The side on which the hemianopsia was is not stated in the original. The report is: "Elle ne pouvait plus voir à la fois, disait elle, deux objects faiblement eloignées l'un de l'autre, et n'apercevait constamment qu'une moitié de la figure des gens qui la regardarent." M. Bellouard, L'Hémianopsie. Thèse de Paris, 1881, cites the case as one of left hemianopsia. It must have been a right hemianopsia judging from the lesion found.

breaking into the lateral ventricle. Internally it had destroyed the posterior third of the internal capsule and the direct medullary tract of Wernicke without involving the optic thalamus. The right corpus geniculatum externum was in a state of red softening. The third member of the nucleus lenticularis and the external capsule were also injured. (Senator, cited by Wernicke, l. c. ii. 70.)

CASE 15. Female, æt. 70, after an apoplectic attack lost the powers of motion and sensation in the entire left half of the body. There was ptosis of the left eyelid and apparent blindness of the left eye, but with the right eye patient could see. During the following fortnight the powers of sensation and motion returned, excepting in the left arm; the ptosis disappeared, and vision was partly regained in the left eye. It was then found that the patient had left hemianopsia in both eyes. Subjective sensations of light annoyed her much. In the left arm contracture of the flexors developed. Headache increasing in intensity was followed by convulsions, and in three weeks the patient died.

*Autopsy.*—The right hemisphere was much softer than normal, especially in the white matter on the roof of the lateral ventricle; and the softening reached as far back as the posterior part of the occipital lobe. The right optic thalamus, and a part of the lenticular nucleus were also softened. There was also a small area of softening "in the upper part of the left hemisphere." Nowhere any hemorrhages. No ventricular effusion. (Lallemande, cited by Wernicke, l. c. ii. 189.)

CASE 16. Male, æt. 40. Suffered for seven years before death from epileptic seizures beginning with spasm of the left leg, and going on to general convulsions, in which, however, the motions were always more violent on the left side. An aura consisting of a darkness coming gradually over the field of vision from the left side always preceded the attack. During the intervals left-sided headache was the chief symptom. It seems probable that a temporary left hemanopsia preceded the attack.

*Autopsy.*—In the white matter of the right occipital lobe was found a cyst of the size of an apple, filled with serum, and surrounded by a zone of softening which did not involve either the cortex or the wall of the lateral ventricle. All other parts of the brain normal. (Traube, *Gesammt. Beiträge zu Pathologie*, ii. 1083.)

CASE 17. Male, æt. 72. Left hemianopsia occurring suddenly with left hemiplegia. Patient lived several months without recovering.

*Autopsy.*—Pia mater over the right occipital lobe congested but not adherent. The convolutions posterior to the fissure of Rolando, on the right side, were softened and the vessels injected. At the apex of the right occipital lobe was a spot of necrosis of the size of a hazel-nut, surrounded by a zone of yellow degeneration which extended over the surface of the neighbouring convolutions on the convexity of the lobe. The softening was superficial, and did not extend deeply into the white matter. A small cysticercus 5 mm. in diameter was found on the inferior surface of the left anterior lobe external to the olfactory bulb; no other lesion. The optic thalami and tracts normal. (Marchand, *Graefe's Arch. f. Ophthal.*, xxviii. 2.)

CASE 18. Female, æt. 8, of tubercular parentage, became irritable and stupid, began to suffer from headache, and two months later was attacked with general convulsions which occurred every few days. Her mental condition became much impaired, but no paralysis or anæsthesia was detected. For six weeks before her death there was left hemianopsia,

*Autopsy.*—A tubercular tumour 3 by 3 by 2.5 cm. was found on the median surface of the apex of the right occipital lobe in the sulcus hippocampi whose sides it separated. It was surrounded by a zone of yellowish-red softening which was limited to the cortex and did not involve the white matter. A second smaller tubercle lay at the apex of the right second frontal convolution. Optic thalami, tracts, and chiasm normal. (Haab, *Klin. Monatsbl. f. Augenheilk.*, xx. 5.)

CASE 19. Female, æt. 61. Left hemianopsia occurring suddenly with left hemiplegia. The latter disappeared, but the former remained one year, until death. The field of vision was limited by a vertical line passing through the fixation point in both eyes.

*Autopsy.*—On the median surface at the apex of the right occipital lobe was found a cyst surrounded by an extensive oval area of softening measuring 6 by 3 cm. The cortex about the sulcus hippocampi was destroyed. The softening was limited to the cortex, a tract of normal white substance lying between it and the posterior cornu of the lateral ventricle. The optic thalami, corp. quadrigemina and geniculata, and the optic tracts normal. (Haab, *Klin. Monatsbl. f. Augenheilk.*, xx. 5.)

CASE 20. Male, æt. 32. After an apoplectic attack accompanied by fever there remained left hemianopsia with left hemiparesis. During the next three months the patient suffered from left unilateral convulsions at intervals. Then after such a convulsion right hemianopsia appeared, leaving the patient totally blind until his death one month after. Convulsions of the right arm and face occurred during the last month, and twice the patient had visual hallucinations. There was no other sensory disturbances.

*Autopsy.*—The brain was œdematous. The pia mater was thickened and opaque in spots over the convexity. Over the left parietal and both occipital lobes the pia mater was deeply congested and firmly adherent to the cortex so that the latter was torn in removing it. The entire cortex of both occipital lobes was very soft and markedly atrophied, the right one more than the left. The medullary substance of both occipital lobes was soft and atrophied, and the post. cornua of the lateral ventricles were distended with serum. Both optic thalami were soft and atrophied in their posterior third. Both optic tracts normal. (Stenger, *Arch. f. Psych.*, xiii. s. 245.)

CASE 21. Male, æt. 52, who had been subject to epilepsy for years, had an attack of left unilateral convulsions without loss of consciousness, followed by paresis of the left leg, paralysis of the left arm, and paræsthesiæ in the left hand. The unilateral convulsions recurred daily for 13 days, when left hemianopsia suddenly developed, and a total loss of muscular sense in the left hand occurred. The paresis gradually disappeared, but the hemianopsia persisted till his death six months after.

*Autopsy.*—Hydrocephalus. Pia mater opaque and adherent over the right parietal lobe, posterior to the central convolutions, and over the anterior part of the occipital lobe to within 3 cm. of its apex. In this region the cortex was soft, yellowish-gray, and much atrophied. The softening encroached on the cortex of the first temporal convolution inferiorly. The right posterior cornu of the lateral ventricle was distended with serum, and its walls were macerated. The right optic thalamus was softer and flatter than the left. Optic tracts normal. (Stenger, *Arch. f. Psych.*, xiii. p. 247.)

CASE 22. Male, æt. 50, was suddenly attacked with left hemianopsia, there being no other brain symptoms. The field of vision was limited by a vertical line passing through the fixation point of each eye. Central vision good. Ophthal. exam. negative. Patient died two weeks after of heart disease.

*Autopsy.*—A large area of softening was found in the right occipital lobe, which extended to the surface on the median side and also to the apex. Optic thalami and tracts normal. (Curschmann, *Centralbl. f. prac. Augenheilk.*, 1878, s. 181.)

CASE 23. Male, æt. 44, noticed on rising one morning a disturbance of vision which was found to be a left hemianopsia. The field of vision was limited by a vertical line passing through the fixation point in both eyes. Central vision and colour sense good. No other brain symptoms. Died several months after, never having recovered his vision.

*Autopsy.*—An old apoplectic cyst the size of a walnut was found in the right occipital lobe. Its upper wall consisted of the three occipital convolutions which were in a condition of yellow softening. Its inner wall did not reach the lateral ventricle. A small apoplectic cyst was also found in the centre of the right optic thalamus; and a pea-sized spot of red softening in the roof of the anterior cornu of the left lateral ventricle. (Baumgarten, *Centralbl. f. d. med. Wissen.*, 1878, No. 21.)

CASE 24. Male, æt. 42, suffered from left unilateral convulsions without loss of consciousness and temporary left hemiplegia with loss of sense of pain after each convulsion. During the convulsion, patient was aphasic. In June, 1878, left hemianopsia appeared after a convulsion, and continued till his death in

April, 1879. During the last few months there was a slight contracture of the left arm.

*Autopsy.*—The convolutions posterior to the fissure of Rolando on the right side were atrophied and sunken in, and the white matter beneath was softened. The area of softening included the entire white substance of the occipital lobe and of the superior and inferior parietal convolutions. Thalami optici, corpora striata, and int. capsule intact. Microscopic examination showed the optic tracts to be normal. No other lesion. (Westphal, cited by Wernicke, *loc. cit.*, ii. 195.)

CASE 25. Male. Left hemianopsia not quite reaching the fixation point. Left hemiplegia. Death after three years.

*Autopsy.*—In the right occipital lobe, posterior to and not involving the optic thalamus, was a large cavity with smooth walls communicating with the inferior cornu of the lateral ventricle. It was found to be the remains of an apoplectic cyst which had destroyed the greater part of the occipital lobe. Corpora amylacea were found on the surface of the chiasm. Both optic tracts normal. (Hosch, cited by Marchand, *Graefe's Arch. f. Ophth.*, xxviii. 2.)

CASE 26. Male, æt. 40, suffered from headache, dizziness, and drowsiness for nine months after receiving a blow on the head; but not to a degree sufficient to interfere with his profession, which was that of a musician. He was then suddenly seized with severe headache and left hemianopsia. No other brain symptoms developed, but these persisted, and the patient went into a condition of coma, and died in eleven days.

*Autopsy.*—In the right occipital lobe was found a large abscess one-and-a-half inch in diameter inclosed in a firm wall of connective tissue. It was situated superficially, and caused a bulging of the convex surface of the lobe. It contained pus and granular matter. A second smaller abscess of the size of a hickory-nut was found in the left anterior lobe surrounded by a zone of softened tissue. No other lesion. (Levick, *Amer. Journ. Med. Sci.*, 1866, Oct.)

CASE 27. Prevost reported a case to the Soc. Med. of Geneva, in 1878, in which left hemianopsia was definitely determined. There was found at the autopsy an extensive lesion of the right occipital lobe, and also a lesion of the optic thalamus on its posterior part involving the corpus geniculatum externum. (Cited by Ferrier, *Brain*, ix. 97.[1])

Cases of hemianopsia produced by lesions of one optic tract are so well known and so frequently reported, that it is not necessary to cite them here. The fact that this lesion produces hemianopsia is now admitted by all authorities. For recent cases see Graefe's *Arch. für Ophth.*, xxviii. 2. From an analysis of these cases, the following conclusions regarding the pathology of hemianopsia may be reached:—

Lateral homonymous hemianopsia may be produced not only by a lesion of one optic tract, but also by a lesion situated either in the pulvinar of one optic thalamus;[2] in the posterior part of one internal capsule or its radiation backward toward the occipital lobe;[3] in the medullary portion of the occipital lobe;[4] or in the cortex of one occipital lobe.[5] Extensive or multiple lesions[6] involving two or more of these portions of the brain produce the same symptom. Hence, a lesion in the course of the optic fibres of one side, at any point between the optic chiasm and

[1] The report is very imperfect. I give it as stated by Ferrier, having been unable to obtain the original.

[2] Cases I. 1, 2, 3. [3] Cases II. 1, 2, 3, 4, 14. [4] Cases II. 15, 16.

[5] Cases II. 5, 6, 7, 17, 18, 19, 20, 21.

[6] Cases I. 4, 5; II. 8, 9, 10, 11, 12, 13, 22, 23, 24, 25, 26, 27.

their termination in the cortex of the occipital region, produces partial blindness of both eyes. It is, therefore, justifiable to conclude that the occipital lobe of each side is in anatomical and functional relation with both eyes; in such a manner that the like-named sides of both retinæ are connected with the like-named hemisphere, *e. g.*, the right sides of both retinæ with the right hemisphere, and *vice versâ*. When a lesion of one hemisphere involves the optic fibres, at any point, partial blindness of both eyes, and not blindness of the opposite eye, is produced.

These conclusions are forced upon us by a study of these thirty-two cases. They conflict with the statement of Charcot as to the course of the optic nerve-fibres;[1] and with the statement of Ferrier that the angular gyrus is the centre of sight in man, and governs the eye of the opposite side.[2] These statements must, therefore, be examined.

Charcot's scheme (Fig. 2), in which all the fibres from one eye are

Fig. 2.

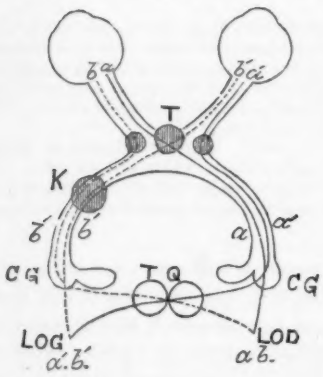



Fig. 3.

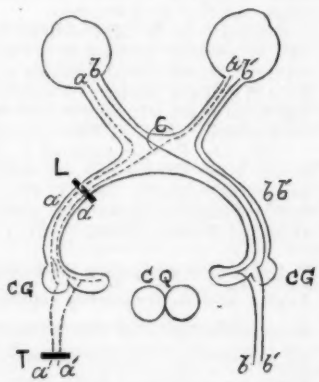



Fig. 2. SCHEME OF THE DECUSSATION OF THE OPTIC TRACTS. (According to Charcot.)—*T.* semi-decussation in the chiasm; *T. Q.* decussation posterior in the corpora quadrigemina; *C. G.* corpora geniculata; *a.' b.* fibres which do not decussate in the chiasm; *a. b.'* fibres which decussate in the chiasm; *a.' b.'* fibres from right eye meeting in left hemisphere, *L. O. G.*; *K* lesion of left optic tract crossing right lateral hemianopsia; *L. O. G.* lesion of left hemisphere producing right amblyopia.

Fig. 3. DECUSSATION OF OPTIC FIBRES. (According to Graefe and Féré.)—*C.* semidecussation at the chiasm; *C. G.* corpora geniculata; *L.* lesion in optic tract; *T.* lesion in left hemisphere producing right lateral hemianopsia; *C. Q.* corpora quadrigemina.

seen to meet in the hemisphere of the opposite side, was proposed in order to explain the symptom of crossed amblyopia (*i. e.*, partial blindness in the eye opposite the lesion), observed in cases of hysterical hemianæs-

[1] Charcot, Le Progrès Medical, 1875, p. 705. Also Localisation des Mal. Cerebrales, pp. 116–127.

[2] Ferrier, Localization of Brain Diseases, pp. 116–120.

thesia. It was not based upon any post-mortem discovery of a lesion in one hemisphere producing the symptom; and Charcot himself stated that it had no anatomical basis.[1] Subsequent examination of the same cases by Landolt revealed the fact that there were visual defects in both eyes instead of in one;[2] a fact which at once invalidated the accuracy of the scheme. An examination of the figure shows that it is inadequate to explain the course of the optic nerve-fibres if the conclusions here reached are admitted. That Charcot himself believes it to be wrong is shown by his approval of the recent essay of his pupil Féré,[3] which proposes to substitute for it the older scheme announced by Graefe in 1860, Fig. 3. The scheme of Charcot is no longer taught in Germany[4] or in France,[5] and is given up by its author. It is therefore needless to discuss it.[6] The symptom which it sought to explain must, however, be examined, as it too stands in opposition to the facts here demonstrated, and forms the basis of a new scheme proposed in February, 1883, by Grasset.[7] Grasset claims that there are several cases on record in which an autopsy has shown that a lesion of one hemisphere, in the internal capsule, may produce blindness in the opposite eye. He cites four cases, which are as follows:—

1. Right hemiplegia with aphasia and right hemianæsthesia. "The right eye appeared blind; in the left eye the field of vision was much decreased in extent." (Bernhardt, *Berlin klin. Woch.*, 1875, No. 36.)
2. Right hemiplegia and hemianæsthesia. "With the right eye the patient can see only very large letters; left eye normal." (Muller, *Berlin klin. Woch.*, 1878, p. 284.)
3. Right hemianæsthesia and hemichorea. "The visual power is $\frac{1}{3}$ in the left eye, $\frac{1}{4}$ in the right eye. Both visual fields are contracted for white light and for colours, but the right is wider than the left." (Féré, *Hémianopsie*, Paris, 1882, Obs. LXVIII.)
4. Right hemianæsthesia and hemiathetosis. "Diminution in the visual power in the right eye." (Ballet and Féré. Féré, l. c. Obs. LXI.)

It is evident that these cases fail utterly to establish his conclusion. In the first case both eyes were affected, not one alone. In the other three cases blindness was not produced in the opposite eye. The condition was simply a diminution in the degree of visual power; and in one of these three both eyes were affected. The statement of Mauthner made in 1881 may, therefore, be repeated: "There is no case well authenticated in which lesion of one hemisphere has produced blindness in the opposite eye." The scheme of Grasset is thus seen to lack any basis in pathology.

[1] Charcot, loc. cit., page 127.

[2] Landolt, La France Médicale, Feb. 3, 1877. Also cited by Charcot, loc. cit., p. 119.

[3] Féré, l'Hémianopsie, Paris, 1882.

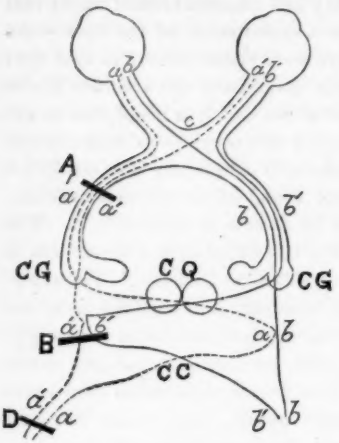
[4] See Mauthner, Gehirn und Auge, 1881. Wien. Wilbrand, Hemianopsie, 1881, Berlin.

[5] See Archiv. d'Ophthalmologie, August, 1883, p. 368. Bellouard, l'Hémianopsie, Paris, 1881.

[6] Prof. Ranney, however, seems to regard it as true. See N. Y. Med. Record, Aug. 18, 1883.

[7] Grasset, Montpellier Medical, 1883, Feb.

Fig. 4.




DECUSSATION OF OPTIC FIBRES. (According to Grasset)

*c*, chiasm; *C Q*, corp. quadrigemina; *C C*, corpus callosum; *C G*, corp. geniculata; *A*, lesion in *l.* optic tract, and *D*, lesion in left hemisphere, producing right lateral hemianopia; *B*, lesion in left internal capsule, producing right amblyopia.

First decussation in the chiasm.
Second decussation in the corp. quadrigemina.
Third decussation in the corp. callosum.

It need only be examined to convince one that it is artificial (Fig. 4). The fibres from the two outer halves of both eyes are made to decussate twice; once in the copora quadrigemina, and once in the corpus callosum. In this scheme a lesion situated in the internal capsule may produce crossed amblyopia, while a lesion in the occipital lobe will produce hemianopsia. It, therefore, explains all possible cases of blindness of cerebral origin, and is adequate to make clear any future cases of crossed amblyopia if such occur. The scheme of Graefe,[1] however (Fig. 3), not only explains all the facts yet established, but is simpler; and in it the course of the optic fibres is seen to be homologous to that of the motor fibres from the parietal region of the cortex to the spinal cord. Both decussate partially, and both bring each hemisphere into connection with both sides of the body. The scheme of Grasset has no such analogous fact to recommend it. Until new facts are brought forward, the scheme of Graefe is to be preferred therefore (Fig. 3).

It remains to examine the statements of Ferrier. His early experiments on dogs and monkeys led him to deny any functional relation between the occipital lobes and vision. To support this he cited thirteen cases in which lesion of the occipital lobes had not produced blindness.[2] Eleven of these cases were recorded prior to 1868 when accurate localization of a lesion in the brain was impossible. It is, therefore, not surprising that in a recent paper[3] he himself ignores these cases, and admits that subsequent experiments have proved his early statement to be wrong. He now holds that in the angular gyrus and occipital lobes are located the centres of sight. Of the four positive cases cited by him in 1878[4] to connect the angular gyrus with vision, one was without autopsy, as the

[1] Graefe, Gazette Hebdomadaire, 1860, p. 708.
[2] Localization of Brain Disease, 1878, pp. 124–130.
[3] Brain, Jan. 1881.
[4] Localization of Brain Disease, pp. 130–133.

patient recovered; two occurred in lunatics, and no exact determination of the limits of the field of vision were made; while the original report shows that the angular gyri *alone* were not involved, but the occipital lobes were also affected,[1] and the fourth is quoted from Bastian,[2] who ascribes the blindness to a lesion of the optic tract and corpora quadrigemina, and *not* to the lesion of the angular gyrus. Of the three positive cases cited in 1881[3] not one is accompanied by a record of autopsy. On the other hand, Ferrier himself gives thirteen cases in which lesion of the angular gyrus was not associated with any defect of vision. And Exner[4] cites twenty-two cases in which sight was not affected. How it is possible under these circumstances to affirm that the angular gyrus has any connection with sight is certainly incomprehensible. The result of physiological investigation on animals can only be accepted as true of man when confirmed by pathological observation. And in a question of this kind cases in man are perfectly worthless unless accompanied by a record of an autopsy, for it is only by a rigid comparison of ascertained limited lesions with symptoms that any conclusion can be reached. As Ferrier does not cite any such cases his conclusions must fall for lack of proof. The discovery of Wernicke, that a direct tract passes from the optic thalamus to the occipital lobe just beneath the angular gyrus, may explain the results of Ferrier. For a lesion of the angular gyrus, unless superficial, would probably involve this direct tract and thus produce a disturbance of vision.

The statement based upon the study of the thirty-two cases here cited is, therefore, strengthened by the fact that opposing conclusions will not bear a strict examination. The visual area lies in the occipital lobes. It is not yet possible to connect definite areas of the cortex of one occipital lobe with definite areas of the retina, as Munk was able to do in the case of dogs and monkeys. Hemianopsia is produced in man whether the lesion lie on the convexity or on the median surface of the lobe.[5]

Any form of brain lesion, abscess, embolic softening, hemorrhage, tumours, chronic meningitis, if located in the course of the optic fibres or on the surface of one occipital lobe, may produce hemianopsia. The symptom is not due, therefore, to the shock of an apoplexy or embolism; nor to an increase of intracranial pressure; as cases occur in which neither of these conditions are present. It must, therefore, be regarded as a symptom indicating a local circumscribed lesion of one hemisphere, and not a general symptom (such as headache or coma) of brain-disease.

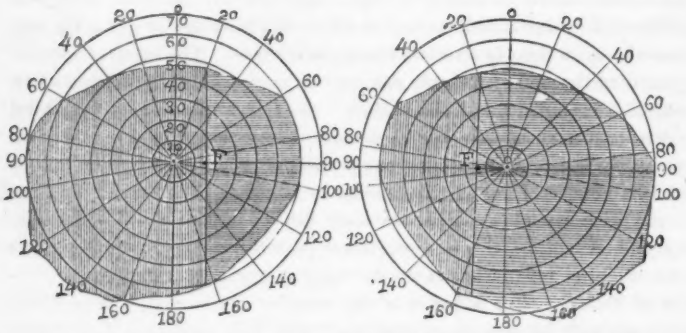
Before proceeding to consider the possibility of making a diagnosis of

[1] Fürstner, Arch. f. Psychiatrie, viii. and ix.
[2] Bastian, Paralysis from Brain Diseases, pp. 113.
[3] Brain, Jan. 1881.
[4] Localization d. Gehirnk.
[5] Compare Cases II. 6, 18, with Cases II. 17, 19.

the location of the lesion in any given case it will be necessary to analyze the symptoms recorded in the cases here cited.

First. As to the symptom of hemianopsia it will be noted that in the majority of cases the hemianopsia was limited by a vertical line passing through the point of fixation. If the visual fields of the two eyes are compared in the figure it will be seen that the defect in the eye of the side opposite the lesion is much greater in extent than in the eye of the same side.

Fig. 5.[1]




VISUAL FIELD OF LEFT EYE. (After Förster). VISUAL FIELD OF RIGHT EYE. (After Förster.)
*F* = Fixation-point; macula lutea. *O* = Entrance of optic nerve; the blind spot.
The vertical lines represent the defect of vision in left lateral hemianopsia. The horizontal lines represent the defects of vision in right hemianopsia.

In right hemianopsia the right eye, and in left hemianopsia the left eye is most affected. It is, therefore, not to be wondered at that in cases of hemianopsia the patient rarely if ever notices the exact character of the symptom, and, usually complains only of disturbance of vision in the eye most affected. It was by careful examination only that the nature of the disturbance was ascertained in the majority of the cases here cited. This fact is of great importance, for it follows that many cases of hemianopsia may escape detection, and that many cases of so-called crossed amblyopia might, if properly examined, prove to be hemianopsia. In proof of this I may refer to a number of cases[2] in which the lesion found was one which should have produced hemianopsia, but in which the report simply states that there was a disturbance of vision without describing its limit or character. Greater care in the examination of cases, and an exact determination of the visual field are necessary.

In all the cases reported here central vision was preserved. This was

[1] The visual field is of course the reverse of the retinal area.

[2] Boston Med. and Surg. Journ., vol. lxii. p. 356; vol. lxxii. p. 100; vol. lxxxiv. p. 252; Archives of Medicine, Aug. 1882, p. 64; Brit. Med. Journ., Feb. 6, 1876.

to be presupposed as only one-half of the macula lutea was affected. It agrees with the theoretical statement of Mauthner.[1]

In all cases, except those in which the nature of the lesion produced an increase of intracranial pressure, the ophthalmoscopic examination was negative.

It may, therefore, be stated that if in any case of hemianopsia the limit of vision passes beyond the fixation point, or if there is a diminution in the power of central vision, or if the visual field is diminished in extent in its entire periphery, there must be some condition present in addition to the local lesion which causes the hemianopsia and not referable to it. Such conditions are to be explained by a defective state of the eye existing prior to the hemianopsia, by an increased intracranial pressure, by a descending optic neuritis, or by some other cause. They are not symptoms of a local lesion. Mauthner states that colour-blindness in the unaffected halves of the eye never accompanies hemianopsia and one case cited here supports this statement. In the other cases no record of colour tests was given.

In eight cases here cited,[2] hemianopsia was the only permanent brain symptom present. In one of these the lesion was in the optic thalamus. In two it was in the occipital lobe, but involved the thalamus. In the remainder it was confined to the occipital lobe. These cases alone would prove the fact that the visual area of the brain is located in the occipital lobes; for the thalamus is to be considered only as a ganglion interposed in the course of the fibres to the cortex, and not as the seat of conscious perceptions of sight. Consciousness is associated with cortical activity only. Visual impressions received by the eye and sent inward as impulses to the brain are, therefore, perceived consciously only when they reach the cortex of the occipital lobes. In order to their perception the tracts to the cortex, and the cortex itself, must be intact. Destruction of other parts of the brain can be shown to have no effect upon vision if this region is uninjured. Hence the conclusion is inevitable that the visual area lies in the occipital region.

Secondly, as to the other symptoms. In thirteen of the cases here cited, permanent hemiplegia accompanied hemianopsia.[3] In all these cases except two,[4] this symptom finds its explanation in a lesion either of the motor tract between the cortex of the parietal region and the crus cerebri, or of the corpus striatum. In some cases one lesion was of sufficient extent to involve both the motor and the visual tracts, where they cross in the internal capsule. In the others the hemiplegia was due to an extension of the lesion from the occipital to the parietal cortex; or to a second lesion

[1] Mauthner, Vorträge aus der gesammt Gebiet der Augenheilkunde, vol. i. p. 360.
[2] Cases I. 1; II. 7, 18, 19, 22, 23, 26, 27.
[3] I. 2, 3, 4, 5; II. 1, 2, 4, 11, 14, 15, 17, 24, 25.
[4] I. 2; II. 25.

in the motor area. We have, therefore, no reason for referring the paralysis to the lesion of the occipital lobe.

The same statement applies to those cases, eight in number, in which hemianæsthesia was a permanent symptom.[1] In these cases a lesion in the optic thalamus, or in the posterior part of the internal capsule, or pressing upon these two parts was the cause of the symptom. The course of the sensory fibres in the brain above the level of the internal capsule is still unknown. The twenty cases of lesion of the occipital lobe without hemianæsthesia, however, furnish the important fact that the areas of common sensation do not lie in that part of the brain.

Aphasia, which was associated with right hemianopsia in ten cases,[2] was either due to an independent lesion involving the speech centre about the left Sylvian fissure, or to pressure upon the island of Reil by tumours, abscesses, or clots in the centrum ovale or the basal ganglia. It is conceivable that a tumour on the base of the brain might press upward into the Sylvian fissure, and inward upon the optic tract and thus in still a third manner produce this association of symptoms. The aphasia cannot, however, be referred to the lesion in the occipital region.

In the cases in which monoplegia occurred[3] there was always found a lesion of the central convolutions in the parietal region, and the unilateral convulsions or monospasms indicated even during life the seat of the lesion.

It is, therefore, evident that the symptoms other than visual cannot be referred to the lesion of the occipital lobes; and further that the visual symptoms cannot be referred to any lesion excepting to that of the occipital lobe. Therefore the visual area must lie in the occipital lobes.

With these facts in view the question arises, are there any means of locating the lesion present in a case of hemianopsia? Reference is here made to lateral homonymous hemianopsia. All other forms are due to a lesion of the optic chiasm or optic nerve. A review of the cases and a comparison of symptoms with lesions will demonstrate that this is impossible. The lesion producing the hemianopsia may lie at any point in the course of the optic fibres from the chiasm to the occipital cortex, and in all cases the character of the hemianopsia may be the same.[4] It is only from a study of the accompanying symptoms, therefore, that the lesion can be located. But each of the other symptoms may be due to lesions situated at various points. If it can be proven from a study of the other symptoms that the lesion must be in one definite position, and at the same time a lesion in that position would intercept the visual tract, a probable

[1] I. 2, 3, 4; II. 2, 4, 11, 13, 15.

[2] I. 3, 4, 5; II. 1, 2, 3, 5, 9, 13, 14.

[3] Cases II. 6, 10, 13, 20.

[4] Ferrier's statement that in hemianopsia of cerebral, as distinguished from optic tract lesion, central vision is retained for several degrees on all sides of the point of fixation, is not supported by these cases.

diagnosis may be reached. For example: if a hemianopsia were associated with hemiplegia and hemianæsthesia of the like-named side, the lesion would probably lie in the internal capsule near the pulvinar of the optic thalamus where the visual and sensory-motor tracts intersect. Or if the hemianopsia were associated with paralysis of some of the cranial nerves to the ocular muscles, with loss of smell, or with anæsthesia of the face, the lesion would probably lie on the base of the brain and be producing destruction of the optic tract. In the latter case an atrophy of the optic nerves would follow in the course of time, and would be most noticeable in the eye opposite the lesion. Aside from these cases it would be impossible to locate the lesion, especially if it were one which gave rise to an increase of intracranial pressure. A number of diagnostic points proposed by Ferrier, by Wilbrand, and by Bellouard, when applied to the cases here cited were found to be worthless, and hence are not stated. The opinion expressed by Mauthner that there are no means of locating the lesion definitely must still be accepted.

The frequency of hemianopsia occurring with hemiplegia must not be estimated by the limited number of cases here cited. There are over two hundred cases recorded in the journals published during the past four years, but only those here given were accompanied by an autopsy. The affection is certainly more common than has been supposed, and as it frequently escapes the patient's notice, should always be sought for when a case of hemiplegia is examined. By careful examination of such cases it is probable that more accurate means of diagnosis may be discovered.

The limits of this article will not permit a discussion of the numerous cases on record in which inflammatory processes located in the visual area have given rise to visual hallucinations; or in which partial destruction of the cortex of the occipital lobes has produced a loss of memory of objects recognized by sight—the interesting condition of psychical blindness, as distinguished from and not associated with actual blindness—or in which total destruction of both occipital lobes has been accompanied by actual blindness of both eyes. These facts unite in supporting the conclusion which has been reached in this article from the study of hemianopsia.

It is evident from a consideration of the facts here stated that anatomical research, physiological experiment, and pathological observation unite in assigning to the occipital lobes of the brain the function of sight. The right occipital lobe receives impressions from the right half of both eyes, and the left occipital lobe receives impressions from the left half of both eyes. The visual area of the brain lies in the occipital lobes.

No. 29 E. 62D ST.

## ARTICLE IV.

### TRISMUS NASCENTIUM, OR THE LOCKJAW OF INFANTS: ITS HISTORY, CAUSE, PREVENTION, AND CURE. ILLUSTRATED BY CASES AND POST-MORTEM EXAMINATIONS, WITH STATISTICAL TABLE OF 229 DEATHS.

By J. F. HARTIGAN, M.D., of Washington, D. C.

DURING the winter of 1877 a discussion arose in the Board of Health of Washington, caused by the continued reports of a large number of cases of this disease by the Medical Sanitary Inspector, Dr. W. D. Stewart, and some of the members expressed decided incredulity in the diagnosis. A committee was appointed to investigate the subject, and in six weeks sixteen cases were observed, two being seen before death. The symptoms presented were so characteristic and uniform as to leave but little doubt of their nature. Three post-mortem examinations, performed by Dr. Triplett, afforded further verification in their anatomical lesions. Thus it may be admitted that there was very good evidence of the correctness of Dr. Stewart's diagnoses. The committee, however, did not agree, either as to the identity of the disease, or its etiology.

About the time mentioned, several of these cases came under my observation, with the curiously uniform post-mortem appearances of congestion of the brain or spine (more commonly the latter), or both, with extravasation, and there was no other lesion observed internally, except engorgement of the lungs. These facts impressed me with the importance of determining, if possible, the nature of a disease so fatal within the first month of infantile existence. The Act of Congress a few months later, abolishing the Board of Health and substituting therefor a Health Officer, afforded me the invaluable assistance of Dr. D. C. Patterson, Coroner of the District, without whose counsel and co-operation in the investigation of these cases the results herein set forth could not have been obtained.

Deaths being continually reported with the train of symptoms of this disease, I made many post-mortems without keeping a record—the results showing only a marked and painful sameness throughout. It certainly seemed to require violence, or some mechanical cause, to produce such grave lesions in infants generally well developed, and otherwise healthy. As post-mortems multiplied, perplexity increased, and stimulated desire to ascertain the cause. Text-books were consulted, but most writers treated the subject unsatisfactorily, ascribing every conceivable condition for its development.

The extravasation mentioned, observed in the posterior part of brain and spine, and the relative situation of the bones externally, now attracted attention. It was found that there was usually a depression of the occipital, or that one side was overlapped by the parietal bone. Here then was rational ground for the process of deduction, or induction. Did these

appearances demonstrate cause and effect? viz., mechanical pressure of the occipital or parietal bones on the brain, through the intervening dura mater, finally expending its force on the pons, medulla oblongata, and the nerves issuing therefrom—a theory which I soon found had been advanced over thirty years before by Dr. J. Marion Sims, then of Alabama. Time has not changed the views of this distinguished gynæcologist, as I learn from a letter recently received from him, and I believe they will stand pre-eminent in the history of his great achievements, and their truth it will be my endeavour now to establish, with some additional facts.

There is no latitude free from the ravages of this disease. It stands first in the long catalogue of fatal maladies; its advent is sudden and unexpected; life promising well is destroyed in a few hours, turning the joy of parents into sorrow, and blasting their well-grounded hopes. So well known is its fatality among midwives, especially the coloured grannies, that it is common to hear them say, "No use to send for the doctor; babies with nine-day fits die sure."

Hippocrates, Aristotle, Celsus, and Aretæus describe the disease. In the works of Galen it is first named trismus. Moschion and Levret, who figured in the first century, entertained an opinion in regard to its exciting cause—that the stagnant blood in the umbilical cord might produce dangerous disease, in which M. Bajou concurred.

All nosological writers have called this species of trismus, tetanus; which Cullen describes as a spastic rigidity of the inferior maxilla, attacking infants between the second and seventh day from birth, and as confined more especially to cold regions.

Clarke, Chrisholm, and Hilary teach, that in the West Indies it prevails in the worst form. It is called there, and in South America, seven days' disease. Hofer (*Acta Helvetica*, vol. i.) testifies that it is present in the Helvetian mountains in Switzerland. According to Dr. P. C. Gaillard, "it occurs among the children of the poor in Russia, Germany, Scotland, and Iceland." In the middle of Germany it occurs oftener than any part of Europe, especially in districts where there is no parochial church, thus obliging the mothers to make long journeys to have their infants baptized. It is also common in some of the northern parts, where the infant is swaddled, arms tied by the side, and fastened to a board, being left to lie in this position often for hours at a time, on the back. M. Fourcroy, who wrote a treatise on the subject in 1744, says, that twenty-four per cent. of children born in St. Domingo die of this disease. According to Dr. John Hancock, in Essequebo, Demerara, and neighbouring islands, the disease kills half of the whole number of infants born, and the mortality is at least ninety-nine in a hundred. Mr. Morrison, who practised for several years at Demerara, and Mr. O'Brien never knew one authenticated case of recovery. Dr. Hüpeden says: "In certain colonies of Guayanas, half the children born die of trismus." On the West Man-

neyer Islands, south coast of Iceland, according to McKenzie, the small number of inhabitants are only kept up by emigration, the disease is so prevalent, carrying off all the new-born. It is referred to in Cleghorn's treatise *On the Diseases of Minorca*, as being very fatal; and Dr. Maxwell says, in the *Jamaica Physical Journal*, "The depopulating influence of trismus nascentium was not less than twenty-five per cent.; it scarcely has a parallel within the bills of mortality."

Dr. S. B. Labatt, in a letter to Dr. Collins, says: "During ten and a half years that I was resident in the Lying-in Hospital, Dublin, I witnessed nearly two hundred cases, and after giving a fair trial to all remedies of repute, in no case when the disease was fully formed did I meet with a recovery." Dr. Evory Kennedy, during his mastership of the hospital, gives similar testimony; and Dr. Collins says of the results of his treatment: "In every instance I have been disappointed."

G. Gaynard believes that the disease is most common in warm countries, and children of negroes seem more predisposed to it. In Africa, on the contrary, the white children are oftener attacked during rainy seasons. He agrees with Matuszynski, and others, who hold that paralysis and death occur only when congestion is replaced by effusion. The most frequent cause is cold, and sudden changes of temperature; he thinks inflammation of the umbilicus can only be a very rare cause.

Dr. Nailer, of Mississippi, declares that about two-thirds of the deaths amongst negro children are from this disease, and so uniformly is it fatal that a physician is never sent for. According to Drs. J. H. Pooley, W. B. Fletcher, J. S. Bailey, Baldwin, Collins, Thomas C. Black, Rush, Fourcroy, Valentine, Von Busch, Goelis, Ducille, Campet, Wooten, G. T. Maxwell, Bierbaun, and John M. Watson, of Nashville, the disease runs its course, in spite of treatment, to a fatal issue. Dr. H. C. Bryson thinks that climate or season exerts but little influence in its production.

S. L. Grier, M.D., of Mississippi, *On the Negro and his Diseases*, affirms that trismus decimates the African race upon our plantations within the first week of independent existence. He has known more than one instance in which of the births for one year one-half became the victims of this disease.

Dr. W. L. Sutton, referring to its great fatality, remarks: "This is strikingly the case in the West Indies and in our Southern States, where some families are awfully scourged, whilst their neighbours almost or entirely escape."

Dr. Meriwether, of Alabama, writes: "It generally appears sporadically, rarely attacking white children, which is to be accounted for by the superior cleanliness of the white race." As opposed to this view, the Editor of the *New Orleans Med. and Surg. Journ.*, vol. ii., 1846–7, remarks that the affection is by no means confined to coloured children in that city, but is occasionally met with in the most respectable white

families. This statement is confirmed by the annual report for 1882, which shows the mortality to be 172 (not including 106 cases reported as infantile convulsions), of which number 90 are white. Similar reports come from other Southern cities.

Dr. A. Vogel saw the disease under all conditions of the weather, and did not believe meteorological considerations had anything to do with it. He made two post mortems without finding any navel lesion. Dr. Collins says: "We have never been able to discover any peculiar morbid appearances which would justify us in offering any explanation of its pathology." Romberg, Olliver, and Prof. Doherty, consider that it results from inflammation and ulceration of the umbilical vessels. Dr. E. Hughes suggests vaginal disease among the causes. Joseph Frank gives chilling of the body in any manner as a cause, while Duges mentions this as the sole agent in its production. Bajou, who has had a large experience at Cayenne, attributes it to cold and sea air, as it is unknown in the interior; Dr. Evans to costiveness. Underwood seriously remarks: "The cause has at length been clearly ascertained, and happily its prevention, by Dr. James Clark, who, perceiving that those houses were free from the disease in which there were no fires, very soon demonstrated it to be owing to the smoke from the burning wood; the negro houses having no chimneys to carry it off."

A few words with regard to filth, bad ventilation, and hygienic surroundings. Dr. P. C. Gaillard, after quoting crowded localities, bad or insufficient nourishment, etc., says:—

"But these do not act with more energy in this than in any other disease, and in fact seem to exert no peculiar influence whatever; for the disease is not observed to be most common in the localities where these conditions most especially obtain, as for instance, in the manufacturing and mining districts of England and Ireland, and in large cities everywhere. Indeed, I have seen it under every circumstance; in the well-kept elevated and isolated spot in the country, as well as the crowded, filthy, and lowly situated city hovel."

Dr. J. S. Bailey (*Med. Record*, vol. v., 1870), in reporting three fatal cases, says: "Vitiated atmosphere and want of cleanliness did not produce the disease, for the apartments were cleanly and well ventilated."

Dr. Ingham (*Amer. Journ. Obst.*, vol. viii., 1875) alluding to a local epidemic of trismus on a Southern plantation gives similar testimony.

To show the relative frequency of the disease in the Lying-in Hospital of Copenhagen, and the affiliated houses scattered in different parts of that city, Dr. Stadfeldt says there were 11 deaths in 10,000 children born in the former, whilst in the latter there were 82 in about the same number of births. "The danger of trismus occurring is therefore greater in the affiliated houses, although the hygienic conditions are better."

Dr. Harrison said (*New Orleans Med. and Surg. Journ.*, May, 1846): "We find it scarcely existing on the main land of Iceland, but in the island of Heimacy, adjacent, such has been its fatality that not a child

has been raised there. These are highly valuable historic facts, which forbid the idea of its having any connection with umbilical injury."

In the *Annales Méd. de la Flandre Occidentale*, 1857, Contenot observes: "Since Bajou wrote on the subject, two-thirds of the infant slaves in Cayenne died in the first days of their existence; M. Boireau also refers to it being frequent and fatal in the French Antilles, and that inflammation of umbilicus is always present. Those attacked at Cayenne before the ninth day are abandoned or left to die." In a case of recovery, reported by him, the umbilicus was healthy. The anatomical lesions he calls an apoplexy of the spinal centre, which is only a terminal consequence of the tetanic disease, and he thinks the case related would have been incurable from the instant a hemorrhagic condition would be realized. After discussing the various causes, he is inclined to the cold theory.

Dr. Thore (*Archiv. Gén. de Méd.*, vol. viii., 1845) gives an account of an autopsy as follows: "A bed of bloody fluid and coagula lined entire extent of spinal canal, outside the dura mater; no trace in spinal arachnoid. Nothing abnormal in brain or membranes; congestion posteriorly of lungs." West says: "The most frequent post-mortem appearance consists of effusion of blood into the cellular tissue surrounding the theca of the cord." "Dr. Goelis, of Vienna, frequently found an appearance of *increased vascularity* in the substance of, and in the membranes enveloping, the upper part of the spinal marrow. The same has been observed by Dr. Thompson, of Philadelphia." (Curling, p. 109.) M. Billard (Stewart's ed., p. 490), after remarking that he had only witnessed two instances of the disease, both of which proved fatal, observes he "found on dissection, *nothing more than an effusion of a quantity of coagulated blood in the spine.*" Bouchet, Continot, Matuszynski, Gaynard, and Barillier say that the congestion and hemorrhage found in dissections are an effect, not the cause of the disease.

In a post-mortem examination in the practice of Dr. Baldwin, he "found the umbilicus enlarged, hardened, and a portion of the surface, to which the cord was attached, dry and red. Membranes and substance of the brain natural. *A thick and very firm coagulum found covering the posterior and lateral surfaces of the medulla spinalis*, extending the whole length of the spinal column. Other organs normal." Bednar saw no constant lesion of the navel in the cases he observed.

Dr. Hester, of New Orleans, says: "It seems to be produced by the action of an unhealthy atmosphere upon extremely delicate and nervous systems." Sir Charles Bell remarks: "In the West Indies it is produced from exposure to the night air, and most probably from exhalation from the ground."

Dr. Joseph Clarke (*Trans. Royal Irish Academy*, 1789) says that up to the end of 1782, of 17,650 infants born in his institution, 2944 died within the first two weeks, or nearly every sixth child, 19 out of every 20 being

from nine-day fits. As the disease had hitherto yielded to no remedy, he directed his attention to its prevention rather than cure. In the old hospital, which preceded the one he refers to, and in a less airy part of Dublin, of 3746 births, only 241 died within the first month, or 1 to 15½. During a period of five or six years in the British Lying-in Hospital, of 3611 born, 146 died, or 1 to 25; while in the London Lying-in, he was positively assured that the death of an infant was a rare occurrence; from which he thought the uncommon mortality of children in the Dublin Lying-in Hospital satisfactorily proved, and therefore ventured to "hazard the following conjectures on the causes of mortality, viz., foul air, uncleanliness, irregularity in the manner of living of their mothers, more especially in the abuse of spirituous liquors." In adopting his mode of ventilation, he also reduced the number of beds in the wards, with the most favourable results. Of 8033 children subsequently born, only 419 died in the hospital, or 1 in about 19⅓.

Dr. M. Bartram, of S. C. (*Trans. Coll. Phys. Phila.*, 1793), was the first to ascribe the disease to the umbilicus, a theory, as has been seen, vaguely referred to by Moschion and Levret 1700 years before. He said it was uniformly fatal among the infant negroes; neglect to bandage the abdomen allowed the umbilicus to become distended and puffed out, this evil being augmented by the friction of coarse cloths and the worst of dressings. "For the most part, it makes its attack with the dropping of the cord, though rarely it occurs several days after it is entirely healed; this is not surprising, when it is compared with several instances upon record of tetanus in adults taking place long after the wound is cicatrized."

A. Colles, M.D. (*Dublin Hosp. Reports*, vol. i., 1818), agrees with Dr. Bartram, and made about 25 dissections, with the following results:—

"The skin forming the edges of umbilical fossa was in some a little raised; on expanding with forceps the floor of this cavity was in the centre raised knob shape. A probe readily passed through it, entering the umbilical vein, the peritoneum covering which was highly vascular sometimes up to the fissure of the liver. The peritoneum covering the arteries was still more inflamed, and extended often up to the bladder. The vein, on being cut open, contained only a few small coagula; its inner surface was pale and free from inflammation, although the coats were much thickened. The arteries contained a thick yellow fluid like lymph, and their coats were thick and hard also. The peritoneal surface of umbilicus showed a soft yellow substance in the centre, resembling coagulable lymph, which formed the prominence mentioned in the external vein, the arteries generally opening into it."

S. B. Labatt, M.D., Master of the Lying-in Hospital, Dublin (*Edin. Med. and Surg. Journ.*, vol. xv., 1819), in reply to Dr. Colles, gives an account of nine dissections, showing that the appearances mentioned are not always present in trismus, and are sometimes found in other diseases.

Dr. John Hancock says (*Edin. Med. and Surg. Journ.*, vol. xxxv., 1831): "The chief and essential cause of trismus is an irritative impression made on the nervous system by the compression of the cord in tying it."

Dr. Chas. Woodworth, of Miss. (*Boston Med. and Surg. Journ.*, vol. v., 1832), reports a fatal case which he thought was produced by irritation in the intestinal canal.

Dr. Von Busch (*Neue Zeitsch. für Geburts.*, vol. v., 1837) says that the disease, according to his experience, always occurs after the cord has dropped off, and not later than the tenth day after birth. In no case had he found suppuration or inflammation externally, and in his new observations of arterial inflammations, the same was seated far distant from the navel. Diffuse peritonitis was found apparently originating at the posterior wall of the bladder. The arteries showed bulbous swellings, the thickness of a goose-quill, and half an inch long. A dense deposit of fibrin, in a sheath-like form, was found between the outer and middle coats, and in the lumen black-looking thrombi. A sound could be introduced from the navel through the arteries up to the swelling. Below they were open to their continuation in the hypogastric. Nothing abnormal about the umbilical vein, but a sound was introduced its whole length also. From his observations, he believes the disease, in most cases, due to this inflammation of the umbilical arteries, possibly produced by the entrance of air.

Dr. C. E. Levy, of Copenhagen (*Neue Zeits. f. Geburt.*, vol. vii., 1839), agrees with Von Busch that inflammation of the umbilical arteries is the cause of the disease. In five of six autopsies which he made, there was also hyperæmia of the brain. In three, extravasation outside the spinal dura mater. In one, unusual injection of arachnoid spinalis. He adds that the spinal extravasation was a post-mortem accident, and attaches less importance to hyperæmia as a cause of the disease.

J. Matuszynski (*Gaz. Méd.*, Paris, vol. v., 1837) gives the result of twenty autopsies, made with the greatest care, by Dr. Finckh as follows:—

"The bodies were covered with linen, wet with vinegar and laid on the belly, so as to prevent infiltration of blood in dependent parts. Most were made thirty-six hours after death, some four to six hours. Around the umbilicus was generally perceived areola of bluish-green colour. In sixteen cases of spine examination, there was abundant effusion of black blood all along the canal, in the space between the dura mater and the canal; sometimes it was limited to cervical or dorsal regions, sometimes extravasation of serum, irregular in location. The dura mater and arachnoid were generally healthy; pia mater almost constantly injected, sometimes thickened. The cord was reddened twice, once was softened, once appeared indurated. All the rest of cases normal. Exudation of blood in cranium, preferably in subarachnoid tissue or ventricles; in one case lymph was found, sometimes serum in ventricles. The brain in two cases was firmer than usual, in others softened. Nothing worthy of note in abdomen or chest. Umbilical vein and arteries were scrupulously examined, and presented no sensible alteration."

Dr. Schneemann says (*Hann. Ann. für die ges. Heilk.*, vol. v., 1840), "That want of oxidation of the blood has much to do with producing it;

and this is favoured by too rapid tying of the pulsating cord, or by placing the child under the bedclothes, and half suffocating it with the foul odours between the sheets of a puerperal woman."

Prof. P. G. Cederschjöld (*Neue Zeitsch. für Geb.*, vol. x., 1841) states, that 42 children treated in the general lying-in house at Stockholm, in 1834, were seized within five months, 34 of whom died. In order to discover its origin, certain meteorological observations were made. After describing them, Prof. Cederschjöld remarks:—

"It appears very probable that the unusually long-continued bad weather mentioned caused not only the many cases of the disease, but created an epidemic which continued long after these atmospheric causes had ceased to exist. It is strange that the disease, as far as I know, did not show itself during this time in the dwellings of the city, or elsewhere, except in the lying-in house.[1]

"Post-mortems showed congestion of vessels, sinuses, and membranes of brain; the distension greatest at the base with extravasation. Spinal cord showed a like condition. The heart and its great vessels were congested; lungs also, and generally collapsed. Liver occasionally congested. Of all in whom the disease was fully developed, not one was saved. Those reported as cured only showed the prodromes, and as these are not at all positive, it is possible that many of these children would not have had the disease at all."

In the *New Orleans Med. and Surg. Journ.*, vol. ii., 1845–6, Dr. Wooten remarks: "I have usually observed the first symptoms to make their appearance about the time the umbilical cord comes away, and from this I at first supposed that it was the effect of awkwardness in dressing the navel by the ignorant midwives who usually attend on the plantations, but careful investigation led to nothing conclusive on this point." In the same number the editor invites communications on the subject, because of the alarming mortality at that period, numbering one hundred and fifty annually in New Orleans.

Such has been the history of this disease, and the various causes given by those who perhaps devoted most attention to it. The suggestion in the article just preceding evidently met the eye of Dr. Sims at the time. At all events, in the same year his first paper appeared in the *American Journal of the Medical Sciences*, giving his interesting views. In the subsequent one, in 1848, after further experience and investigation, he made clearer those views, modifying some of his first propositions. Before discussing them in connection with my own facts and cases, I shall proceed to review much of what has since been written on the subject, referring also to the claimed analogy to tetanus in the adult.

Dr. Baldwin, of Alabama (*Amer. Journ. Med. Sci.*, N. S., vol. xii., 1846), sustains its identity with tetanus in the adult, believing it to be *generally*, if not always, traumatic, and locating its exciting cause in the

[1] Dr. Busch, who translates the article, here makes the following note: "This circumstance appears to me to speak against the assumption of the author that weather changes produced the disease, and it may be assumed that local causes, or harmful influences existing in the institution, had probably more to do with its appearance."

umbilicus. He recites other agencies in producing the disease among negro children, such as want of attention and proper preparation on the part of the mother, illy constructed houses and surroundings, mode of dressing of umbilicus, filth, with a predisposing condition of the atmosphere. With regard to the pathology of the disease and tetanus in the adult, he thinks "the reflex function of the 'excito-motory' nerves," as demonstrated by Marshall Hall, is a clear solution of the phenomena observed. Dr. N. Meriwether, of Alabama (*Amer. Journ. Med.. Sci.*, vol. xxvii., 1854), believes the disease is caused by absorption of pus by the umbilical vessels. Dr. D. P. Calhoun, of Louisiana, and others, write that they have had frequent opportunities to test the practice recommended by Dr. Sims, and found it highly successful. Dr. John M. Watson refers in a sarcastic vein to Dr. Sims's explanation, and holds with much positiveness that the umbilicus is, with few exceptions, the constant exciting cause of the disease.

Dr. W. L. Sutton (*Nashville Med. Journ.*, vol. iv., 1853) thinks the relation that displacement bears to trismus may be considered as *sub judice*.

"A point made by both Baldwin and Watson is the similarity of time in the period of incubation. I think they have been a little hasty in their assumption; the best criterion is the test of truth. Curling has given a table of 124 cases of tetanus in the adult with the time from the reception of the injury to the appearance of the disease; and a table of 185 children dying of trismus, and the number of days they lived. Collins also has given 34 cases of trismus with the day on which each was attacked—also the duration of the disease in 30. Of the 124 deaths the disease appeared in 90 after the *seventh* day; whilst of the 185 children 131 died on and before the *seventh* day. Again, of the 124 by Curling, 70 were attacked after the *ninth* day. Of the 185 children, 165 died on or before the *ninth* day. But of the 30 cases given by Collins in which the duration of the disease is stated, the average was 31.7 hours. Subtract this from the time lived by Curling's infants, and we have about 155 attacks on or before the *seventh* day, or 84 per cent., whilst of 124 adults, 54, or 43.5 per cent., were attacked on or before the *seventh* day. But even this falls short of the proper view, for if we take Dr. B.'s standard and adopt the separation of the cord as the time at which the injury is received, then assuming four days from birth as the time of separation, all of Collins's cases will fall *short* of *seven* days and 175 of the 185 of Curling's. Again in Collins's cases and in Curling's the disease occurred on an average two days after the average time for the separation of the navel, whilst in the 124 adults by Curling the average time at which the disease supervened was 11.67 days. I think, therefore, the facts do not bear out the conclusions of Drs. Baldwin and Watson."

"It is worthy of remark," Sutton concludes, "that Prof. Harrison, of New Orleans, detected the displacement of the occipital bone and attempted its restoration fifteen months before the publication of Dr. Sims's first paper."

On page 203 of the same volume, Dr. Sutton details a case that came under his notice since writing the foregoing. His conclusions are that the child was born trismal, that the disease was brought on by pressure from the occipital bone.

Mr. J. Harrison, F.R.C.S. (*Brit. Med. Journ.* i., 1860), agrees with Dr. Colles, but does not claim that trismus is the only disease that may arise

from a festering navel, as is shown in the following, which he saw on the sixth day: "The child had a grievous look—sunken—clearly from grave mischief; the umbilicus was festering, abdomen distended and hard. It died on the eighth day. At the post-mortem the umbilicus was red and prominent; there was universal peritonitis, and the liver was wholly covered by false membrane. In this case there were no symptoms of trismus."

Dr. Hervieux (*Gaz. des Hôp.*, 1862) says that meningeal apoplexy of the spinal cord is the nearly constant lesion, and the most probable cause is cold. No disease of umbilicus or of any of the organs was observed in the two cases he reports.

M. Le Barillier (*Journ. de Méd. de Bordeaux*, May, 1863) recognizes eclampsia as different from trismus, and neither like tetanus of the adult. In a case of trismus that he details, the autopsy showed no trace of inflammation of the umbilical cord. The condition of the brain and spine accorded with appearances described by Thore and Hervieux.

Dr. G. Dowell (*Amer. Journ. Med. Sci.*, vol. xlv., 1863) thinks that the primary cause of the disease is in the umbilicus, brought on by congestion of the liver from coagulation of blood in the umbilical vein, having several times found such changes in post-mortem examinations. He ascribes among the many causes a hereditary tendency.

Dr. J. Lewis Smith mentions uncleanliness and impure air among the chief factors in the causes. The ten cases observed by him were all in shanties where habits of cleanliness were impossible, and he never saw or heard of a case in the better class of domiciles.

"According to Romberg, Dr. Scholler found inflammation of the umbilical arteries in 15 out of 18 autopsies. Dr. Finckle made careful examination of the umbilical vessels in 11 cases, without discovering any pathological change."

"In the *Edinburgh Med. and Surg. Journ.*, Jan. 1822, Dr. James Thomson, who spent considerable time in the tropics, examined nearly 40 infants, and found the navel in all states. "In the *Dublin Journ. of Med. and Chem. Sci.*, Jan. 1836, Dr. John Breen remarks: 'In my own experience there was no evidence of disease in the umbilicus.'"

From such statistics as the foregoing Smith says that while umbilical disease is a frequent cause of tetanus nascentium, yet cases occur in which we must look for some other. He thinks that, if Dr. Sims's mode of explanation was correct, it would ordinarily occur sooner; compression of the medulla would certainly be followed by immediate and marked symptoms, instead of an immunity for four or five days.

"After its publication, cases were related in which there was no occipital displacement. In my own it was sometimes noticed, but in no instance did the depression seem to be a cause, but a result, and it became more marked as the disease advanced. The correct explanation is probably as follows: If the newborn infant becomes emaciated, the volume of the brain is diminished, like that of the trunk or limbs, and the sinking of the occipital bone simply corresponds with the amount of waste in the cerebral substance. In fatal tetanus nascentium emaciation is very rapid. Viewed in this light, the occipital depression, so far as it has any effect, must be regarded as conservative. It prevents serous effusion, which, in a similar state of waste, occurs in older children, whose cranial bones are consolidated."

Dr. Hüpeden (*Zeitschrift für Epidem. und Offentliche Gesundheitspflege*, 1868–71) says:—

"Within six months of 1865, 100 cases had occurred in Elving, 21 of whom were in the practice of one midwife; the condition of the navel was supposed to be a cause, but the mode of dressing and care did not confirm it. In Lüneberg 14 cases occurred in 1867, 11 with one midwife (dirty sponges or bandages could not be proven as having been used). Instances being reported of many cases occurring among certain midwives, and none among others, gave rise to suspicion. Investigation resulted in one woman being 'pensioned,' after which no more cases occurred. 'Anæsthesia' of the hands of another woman, and hot baths, were thought to be causes, but were 'disproved.'"

Dr. G. A. Ketchum (*Trans. Med. Assoc. Ala.*, 1871) believes that it is always a traumatic tetanus attributable to the umbilicus, but admits that other circumstances act as predisposing causes, such as hot weather, foul air, and too much bedclothing. In all his cases there has been more or less evidence of inflammation or ulceration at the umbilicus, or the navel has been fretted by the dressing or tight bandaging, and he condemns the practice of allowing the original dressing on the navel. Two cases are related—one died and the other recovered under the use of chloral.

Dr. J. Bierbaum says (*Deutsche Klin.*, vol. xxv., 1873):—

"The constitution has no effect, as the strong and weakly are alike seized. Neither has season an influence in its production. The true home of the disease, however, is in the South, particularly in the West Indies. According to James Clark, in America the smoke of green wood in the chimneyless huts of the negroes very frequently is the cause, but I doubt this. Here in Westphalia, on the contrary, in the chimneyless huts where the smoke is so thick that one scarcely can see or hear, where they burn green and dry wood, turf, and sawdust, the disease is rarely seen, or, at all events, is not seen oftener than in the clean dwellings of the well-to-do. A very high value has been placed on the activity of the skin as an etiological factor. It was observed in many cases where colds have been taken, and in many colds have nothing to do with it, nor atmospheric nor telluric influences."

Dr. Stadfeldt says (*Archiv. de Tocologie*, 1874) that his experience is opposed to the umbilical theory. According to his notes of 20,806 births, the mortality of trismus was 1 in 224 births, 51 male, 42 female, 50 multipara, 43 primipara; all were fatal. Sex, nor duration of labour present no disposition in producing the disease. In 88 cases, 1 death occurred on the 4th day, 3 on the 5th, 13 on the 6th, 29 on the 7th, 25 on the 8th, 9 on the 9th, 7 on the 10th, 1 on the 12th. As opposed to the assertion that it prevails preferably in puerperal epidemics, he says that in 1854, there was a good deal of trismus and little puerperal fever, whilst the reverse was the case in 1864. Most of the cases occurred in summer.

In the *Amer. Journ. of Med. Sci.*, vol. lxix., 1875, Dr. P. A. Wilhite, of S. C., records 14 cases treated on Dr. Sims's plan. Of this number, three cases of the acute form were cured by position alone, and two died without treatment before he saw them. The other nine presented the chronic or trismoid affection, five of whom recovered from position alone, and four succumbed without the discovery of the means of rescuing them. In all, the pressure was produced by depression of the occiput.

In the *Med. Record* for Dec. 2, 1882, Dr. J. G. Thomas, of Savannah, writes that adhesion of the prepuce produces a certain percentage of cases in male children, and cold draughts of air prove an active factor in causing the disease in both sexes.

The following references may be of interest, as showing chiefly the reports of cases treated successfully and otherwise by various remedies :—

*Annales de la Méd. Physiol.*, vol. xvii.; *Edinburgh Med. and Surg. Journ.*, vol. xxxiii.; *Amer. Journ. Med. Sci.*, vols. vii., xvii., xviii., xlv.; *Archives Gén. de Méd.*, vol. viii.; *N. O. Med. and Surg. Journ.*, 1845–6, 1846–7, 1854–5, 1874–5; *Casper's Wochenschrift*, 1846; *Charleston Med. and Surg. Journ.*, vol. iii., viii., xii.; *St. Louis Med. and Surg. Journ.*, 1849, 1881; *Western Lancet*, vol. xiii.; *Southern Journ. of Med. and Phys. Sci.*, vol. iii.; *Nashville Med. Journ.*, vol. xv., xix.; *Chicago Med. Examiner*, vol. i.; *Gaz. des Hôp.*, 1862, 1863; *St. Louis Med. Archives*, vol. ii.; *Indiana Journ. of Med.*, vol. i.; *N. Y. Med. Journ.*, vol. x.; *New So. Wales Med. Gaz.*, vol. ii.; *Chicago Med. Journ.*, vol. xxviii.; *N. Y. Med. Record*, 1872; *Rich. and Louisville Med. Journ.*, vol. xvi.; *Phila. Med. Times*, vol. iii., v.; *L'Imparziale, Florence, Italy*, vol. xiv.; *Medical Reports, Shanghai*, 1876; *Amer. Med. Bi-Weekly*, vol. vi.; *Ohio Med. Recorder*, 1877; *St. George's Hosp. Reports*, 1879; *Atlanta Med. and Surg. Journ.* 1879–80; *St. Louis Med. and Surg. Journ.* 1881; *Mich. Med. News*, 1881; *Brit. Med. Journ.*, i., 1881; *London Med. Times and Gazette*, i., 1882; *Can. Med. and Surg. Journ.*, 1881–2.

In this connection, Copeland remarks :—

"If we consider the diverse, or even opposite nature of the measures which have been prescribed for this malady, their apparent success in some instances and their failure in others, and their employment in different states of the disease, with little regard to the navels, or their operations in relation to pathological conditions, we necessarily must infer that recovery has sometimes taken place notwithstanding their use, and not by their aid."

Due warning of the effects of pressure, or approach of the disease, is given by the child being disposed to whine and cry; it may be subject to heavy, deep slumber, or starting in sleep; is languid, moans, cannot take the breast, although seemingly anxious to do so. A peculiar restlessness or twisting of the upper extremities while awake without evident cause, sudden changes of colour, screwing of the mouth, accompanied at intervals with a characteristic shriek, are reckoned sure forerunners. Generally, with one or more of these symptoms preceding, the infant is seized as if by an electric shock. These follow every few minutes, when "every muscle is thrown into distorted action, showing the wrinkled forehead, livid countenance, elevated brow, closed eye, dilated nostril, rigid masseter, fixed jaw, closed mouth, bubbling saliva, retracted head, turgid veins, arched spine, raised chest, troubled breathing, catching diaphragm, heaving abdomen, separated arm, squared elbow, bent wrist, clenched fingers, incurved thumb, extended legs, bent down toes, the whole figure rigid as wood—a pitiful sight."

The paroxysm is renewed by a slight noise, the gentlest touch or zephyr. A placid interval of a few minutes succeeds, and then another fit follows. There is no uniformity about the action of the bowels or kidneys. Emaciation rapidly advances. The skin assumes a brownish hue, and hangs in shrivelled folds of leathery texture. Peace and pang pursue their sickening interchange, and the child sinks by degrees exhausted.

From such a history it is no wonder so many conflicting theories have been advanced as to the cause of this disease; in fact, anything that the writer happened to fancy or guess, has been offered.

In his first article, Dr. Sims very truthfully said that—

"The causes have been points of debate and conjecture, and of its true pathology we have never had any settled opinion. Its treatment has consequently been one of varied empiricism. Wherever are poverty, filth, and laziness, there will it be oftener found. Wealth, a refined mind, and affectionate heart, are comparatively exempt from the ravages of this unmercifully fatal malady. But, expose this class to the same *physical* causes, and they become equal sufferers with the first."

In illustrating the great rigidity of the frame, in one of the cases that he reports, he caught hold of the feet and raised the whole body without flexing the thighs on the pelvis. He then ran his hand under the head for the purpose of elevating the body in the same way, when he immediately detected a *remarkable irregularity* in the feeling of the bones. *It had lain during the whole of its illness exactly in one position all the time, the weight of the head resting wholly on the os occipitis.* The pulse was uncountable, and the breathing, from 120 in a minute, was reduced to 70, with a corresponding amelioration of the other symptoms. This occurred within ten or twelve minutes after he had taken up the child for examination, and in this way he discovered the relation of *position* to the disease. The child dying the next day, a post-mortem examination showed the superficial vessels of the brain full of black blood, and coagulum occupying the whole length of the spine.

In his second article, published in 1848, Dr. Sims says that new facts and observations had satisfied him that deficient ossification of the cranial bones was not essential to the production of the disease; and it was not intended to be understood as a *pathological* condition, but simply the *physiological* state so necessary to a safe and easy parturition. He modifies his statement as to *dorsal decubitus*, having found that children may have trismus, and at the same time be kept on a feather bed, when they are laid upon what is usually called *the side.* He also admits that a child may die of the disease in its most aggravated form, and yet have no extravasation within the spine. He says the position is fully sustained—

"That trismus nascentium is a disease of centric origin, depending upon a mechanical pressure exerted on the medulla oblongata, and its nerves; that this pressure is the result, most generally, of an inward displacement of the occipital bone often very perceptible, but sometimes so slight as to be detected with difficulty; that this displaced condition of the occiput is one of the fixed physiological laws of the parturient state; that when it persists for any length of time after birth, it becomes a pathological condition, capable of producing all the symptoms characterizing trismus nascentium, which are relieved simply by rectifying this abnormal displacement, and thereby removing the pressure from the base of the brain."

Of his first case of *trismoid*, or chronic form of the disease, that he saw he says:—

"If the occiput was so much displaced, and the child lived *five* months, how is it that they die very suddenly, and that often, when the occiput is so slightly displaced as to be scarcely discoverable? Let us examine the facts for an explanation. The child was kept all the time in a cradle, without a nurse. The cradle was too short to allow it to lie flat down, so it was kept in a semi-erect position, with its head supported by a large old pillow of chicken feathers, all matted together, the cradle was too deep and narrow to allow it to turn on its side, even if it had been strong enough to do so; the unvarying 'dorsal decubitus;' kept the occiput displaced; the semi-erect position threw the weight of the head on that point of the occiput between the occipital protuberance and the posterior fontanelle; this necessarily tilted the mesocephalon forwards against the cuneiform process of the occipital bone, and pressure exerted on the pons always produces chorea or paralysis, or both, in exact proportion to the amount and degree of pressure. The semi-erect position was altogethor favourable to the prolongation of the disease (and of life), because, in a perfectly supine position, the weight of the head would have rested lower down on the occiput, which would have displaced the bone, so as to press more on the medulla oblongata and the eighth pair of nerves, and thus the patient would in all probability have died at a very early period of asphyxia."

He then passes on to a class of cases in which it is not so easy to detect the occipital displacement, and in which there will be less of the "dorsal decubitus;" but in which the true relative position of the bones may be readily detected, when the way of doing so is understood.

"One of two things must *invariably* exist: either the occiput will be under the parietal, or *vice versa*, according to the position in which the child has generally been retained. If it is not ascertained almost by the sight alone, I press the forefinger firmly against the occiput, about half an inch from the lambdoidal suture, and at a point about half way between the posterior fontanelle and the mastoid process. I now pass the finger slowly and cautiously across the suture; at every step making firm pressure. When the finger arrives at the suture, or commissure, if the occiput is under the parietal bone, it will be found to yield, and the finger, coming in contact with the edge of the parietal, will have to be elevated a little so as to pass over on to its free border; but if the occiput is on the outside of the parietal, then the finger meets with no obstruction; on the contrary, it glides smoothly over, and falls on to the parietal. The proof will be found in a retrograde manœuvre."

These teachings are fully in accord with my own experience. The arguments adduced by Dr. Sims all go to show that the disease is the result of pressure exerted at the base of the brain by *inward* displacement of the occiput, differing in degree from the slightest to the greatest. There is yet another class of cases which he describes, plainly caused by an opposite state of things, viz., by prolonged *lateral* decubitus, the occiput being *exterior* to the parietal bones, and in his paper he fully explains the mechanism of its production and the rationale of the symptoms observed.

I shall now consider those cases which came under my own observation, and which for convenience I have divided into three classes: 1st. Those that recovered under postural treatment. 2d. Cases in which post-mortem examinations were made, many of which were seen before death, but too late to render any service. 3d. Those whose history was obtained after death, the majority also having been seen before fatal results ensued, but where post-mortems were not permitted.

The first class embraces six cases, mostly of trismoid. This is to be expected for the reason that the acute form, which runs a more rapid course, is seldom seen by the physician, or when he is called the patient is generally in the hopeless stage of extravasation; or, on account of severity of the paroxysms, death has taken place from asphyxia. Hence I have included in the statistical table of 229 deaths which follows, all under a month old only. I made altogether about 150 post-mortems, but to save repetition, I have selected at random the 25 recorded in Class II., and the 18 in Class III., as a fair average of the general results.

The peculiar degree of pressure, as shown in Dr. Sims's illustration, accounts for what he appropriately denominates trismoid, or the chronic form of the disease.

CLASS I. CASE I.—On December 10, 1878, while visiting a patient, I was asked to see a dying child eight months old, not that it was thought I could do any good, but just to pacify the distracted mother. On entering the room Mrs. C. told me her baby had been sick since it was four weeks old, and at various times was under the treatment of three physicians—the last an irregular—for "bowel complaint and fever," but nothing had seemed to give relief. The first thing she noticed was that the child began to fall away; it had diarrhœa, occasional vomiting, convulsive twitchings, and almost constant whining, crying, or fretting; when laid in the crib it would cry piteously, all the symptoms then becoming aggravated, and would roll its eyes and sway the hand aimlessly backwards and forwards. All these distressing symptoms had continued steadily progressive, the loose bowels being especially marked, as many as twenty-two operations occurring in one day, chiefly of blood and mucus.

She said she had been expecting it to die every day, the doctors having given up all hope; it had repeated weak spells, and would lie apparently breathless with cold and clammy extremities, never sleeping as other children.

The child on first sight was the least promising case I ever saw. The pale and waxy look sadly portrayed its sufferings, and confirmed the history just given; it was indeed a living skeleton, presenting in addition the appearances of incipient hydrocephalus. Taking the little sufferer from its recumbent position, I carefully passed my hand over the parietal and occipital regions, and had no trouble in detecting an unnatural unevenness at the junction of these bones, the occipital being overlapped perceptibly by the parietals. By gentle manipulation the bones were adjusted with a snap, when (although it may appear fanciful) I was at once rewarded by a bright upward look of the child as though it had been suddenly relieved from great pain or shock. Even yet I felt doubtful that it could rally, and I did not allow my enthusiasm to exceed caution in the prognosis. I endeavoured, however, to explain to the mother that *position* was the last chance of saving life; that she must watch it, now that the bones were in apposition, and keep them so; that she should not lay the child on its back, but change it from side to side. As for medicine, none was needed. At my visit next morning the transition was wonderful. The mother, buoyant and happy, held the babe in her arms just awake from a natural slumber. She said she was so impressed with care in carrying out my instructions that she had not laid the child down since she saw me, having sat up with it the whole day and night; that she was

encouraged by the favourable change from the first, the child having had a long sleep, something so novel—indeed it had not slept at all for 48 hours before—and on awaking cried for nourishment, after which it began to look bright and notice things, and she now knew it was getting well.

Improvement continued, there being no return of a single bad symptom.[1]

CASE II.—Infant of G. C., coloured, male, fifth child (one died of the disease when three weeks old), born March 31, 1879, and was perfectly well up to May 6th, when straining and griping pains of the bowels were noticed, followed by a marked convulsion with slight opisthotonos; this wore off in a few minutes and was succeeded by a calm sleep. The second and third paroxysms occurred the following day, crying, jerking, or moaning, filling up the intervals until I saw it May 8th. I found it extremely weak and emaciated, having refused food for two days. Examination showed the parietal bones overlapped by the occipital and quite fixed. Having given directions as to position, I left, and was accompanied on my visit next morning by Dr. Marsteller. There was a marked improvement, and it had nursed feebly during the night. The day following he was still further improved, now seizing the nipple without assistance; the fingers were also flexible, and the secretions normal. I saw my patient for the last time on the 12th and discharged him perfectly cured, without a dose of medicine.

CASE III.—Female child of Mrs. K., white, finely developed, three months old. I saw this case with Dr. Marsteller on the 28th September, 1879; was quite well up to the 23d, when it commenced to fret, and had an "inward spasm." The mother thought these were symptoms of teething, and was not alarmed until it became indifferent to the breast, followed by bloody discharges; whining and fretting were constant, and the only way it slept, or had relief, was when held erect in her arms.

Upon examination it was difficult to detect any irregularity of the bones, the head being so rounded and well formed; on the left side, however, there was some wedging and tenderness at the junction of the occipital and parietal. Pressure here produced such an aggravation of the symptoms that the mother, thinking we were injuring her babe, snatched it precipitately away. She said that the nurse was in the habit of laying the child flat on her knees, and bouncing it to make it quiet. I simply gave directions as to position, and was rewarded in the morning by the intelligence that it had slept well, and nursed a little better. The second day it was entirely relieved, and there was no further bad symptom.

CASE IV.—Infant of L. S., coloured, female, born October 11, 1879. On the 26th the mother called at the coroner's office for a certificate of death in the case of its twin brother. She stated that both had been sick almost from birth, and she was obliged to work, and leave them in the care of strangers. In her absence they were fed on the bottle, having only the opportunity to nurse night and morning, when they would attempt to take the breast, in the intervals of the spasms; these ensued about ten days from birth, both children being affected alike, the boy having just died. No physician in attendance.

Before leaving the office she asked for a certificate also for the girl, remarking that it would be dead before her return, but in reply to this request she was told she "had better wait until it died."

[1] Mrs. C. brought this child to see me last summer. He is now five years old, has remained perfectly well, and is a bright rollicking little fellow.

Happening to meet the coroner soon afterwards, he informed me of the circumstances, and accompanied by Dr. Clarke Patterson I visited the house, an overcrowded tenement in a healthy locality. The room, which was occupied by three adults, was full of smoke and the fumes of cooking. It was about seven feet high, and ten feet square, with two windows slightly raised and the door so situated as to favour the hurling of the cold wind through the apartment; a bed filling half the space, one chair, an old bureau, and the stove which blocked the entrance, constituted the contents. On looking around we beheld the dead child under the window ready for burial. It was yet warm, and the wrinkled emaciated countenance, flexed thumbs, and marked occipital depression, indicated the work done. On the only chair sat a coloured woman with the subject of this case in her lap, the occiput being pressed directly inwards. The child was so exhausted it could not afford a respectable paroxysm. There it lay, dried up, wrinkled, and frowning with suffering, the very picture of a septuagenarian; it jerked and grunted, and weak as it was, threw itself into painful contortions. These symptoms, the woman said, had continued all the week, she did not know how it was alive, and when she could do so she had fed it with a spoon. Although I did not think the child would live, I gave the usual directions as to posture, and offered a pecuniary inducement if she could arrange to care for it better. In a little while it took the bottle, seemed easier, and fell asleep.

As a certificate of death was not called for, the next day I visited my patient, and was agreeably surprised to find it better. The day after there was a further improvement; the fingers and thumbs were now flaccid, and it nursed freely from the bottle held in my hand. The weather being cold, I cautioned them again about exposure to the open window. I saw it well wrapped, and had reason to believe the child was steadily gaining. Recovery was complete on the fourth day. I therefore did not call again until the sixth, when, to my great vexation, symptoms of pneumonia presented, and the child died that evening.

*Autopsy* in 30 hours. Brain and cord *perfectly normal.* Lungs intensely congested.

Examination of the brother showed dotted extravasation, and congestion of spine and brain. Thoracic and abdominal organs healthy.

CASE V.—Female child of Mrs. A., five months old; was well up to the time her mother started with her from Montana. The long ride exposed it to an attack of pneumonia, for which I was first called. After the physical signs and other evidence of this disease had subsided for a reasonable time, I was at a loss to account for the fretful condition continuing. For several nights there was no rest for the mother or other relatives, the child constantly whining or crying—and it was only able to nurse sufficiently for a bare existence. My attention being directed to the head, I discovered an irregularity of the left occipito-parietal region; manipulation did not seem to effect any result. I directed the position of the child's head to be maintained in the usual way, laying great stress on the importance of this. A good recovery slowly followed.

It will be apparent that the symptoms of trismoid were at first obscured by the pneumonia, and that both conditions were due to the long ride, the mother holding the babe in her arms, which, with the motion of the train, added to the pressure on the head.

CASE VI.—Mrs. L. O., German, primipara, was delivered Feb. 5, 1882, by Dr. H. E. Leach, of twin boys; labour lasted 42 hours. The first was a breech presentation, the second was born 20 minutes afterwards, feet foremost. They did well up to the 12th day, on the morning of which the mother was awakened by this child crying; after nursing, it quietly went to sleep again. About 7 o'clock she was alarmed at its refusal to nurse, followed by a characteristic trismus paroxysm. About noon, when the doctor arrived, he found the spasms had continued almost without intermission. He notified me, and placed the child immediately in a proper position on the right side, having detected an unevenness on the left, when the spasms at once ceased, and did not recur until about 4 o'clock. This was induced by myself in presence of the doctor, but soon passed off on removing pressure of the finger on occiput. The child fully recovered. The hygienic surroundings were all that could be desired, and there was never a clearer illustration of cause and effect.

CLASS II. CASE VII.—On the 12th March, 1879, I was asked by Dr. Leach to see the 7 day male child of V. C., coloured. Had nursed heartily up to the evening of the 10th, when it commenced to shrug the shoulders, cry, jerk, and draw itself up, spasms soon following. We found it lying in a constrained position partially on the back, occiput pressing against the edge of a hard bolster. Upon examination marked depression of the occiput was discovered. The cord had dropped off the previous day, leaving a raw surface, through which unhealthy pus exuded.

In addition to postural treatment, calomel and chloral were ordered every two hours, with application of turpentine and sweet oil to the abdomen and spine. In the evening the child was thought to be improving. Next morning, however, developed no change except the greater exhaustion of the patient; paroxysms had continued at about the same intervals during the night. Death took place, just 72 hours from attack.

A very careful post-mortem showed no extension of the disease of umbilicus, the arteries and vein presenting a smooth healthy appearance; nothing was discernible in the peritoneum or liver. Lungs were highly engorged. A few small clots were found in the posterior portion of cerebrum and cerebellum; but the entire spinal canal, external to the dura mater, was lined with dark coagulated blood.

(I learned from the grandmother of this child that she had had 15 children, 9 of whom died before they were two weeks old from this disease.)

CASE VIII.—Female child of M. W., coloured, primipara, born March 14, died March 27, 1879, sick three days. Usual history, "was stiff all over;" laid mostly in a stupor during intervals of paroxysms, but there was visible evidence of suffering. I satisfied myself from questioning that the child's occiput rested chiefly on the mother's arm. A physician was summoned the first day, who failed to recognize the disease.

*Autopsy* showed marked occipital depression. Umbilicus healthy. Lungs and brain highly engorged. Spinal canal lined with coagula. Other organs normal.

CASE IX.—Female child of H. W., coloured, died April 1, 1879, aged four months. All that could be learned was that she had been sick one month, with occasional spasms, and was very much emaciated.

*Post-mortem* showed marked occipital depression, the left edge being more overlapped than the right. Large clots were found over the left

hemisphere; brain and spinal cord much engorged. Surface and substance of lungs studded with miliary tubercle. Other organs normal.

CASE X.—Infant of Sarah T., coloured, male, born May 16, 1879. Had first convulsion half an hour from birth, followed by four more, and died 17 hours after delivery.

*Autopsy* in 42 hours. Occipital depression and "looseness" of cranial bones from deficient ossification. Lungs, brain, and cord congested.

CASE XI.—Female child of L. W., coloured, born Sept. 12, 1879, seized sixth day, and died in 60 hours.

*Autopsy* 24 hours after death. Navel healthy. Occiput markedly depressed. Brain and pia mater congested, several hemorrhagic spots were seen in the meshes of the latter. Cord lined with coagula.

CASE XII.—Infant of C. G., well-developed coloured female, born Sept. 15, 1879. Was well up to the morning of 19th, when, on being put to the breast, refused to nurse. Upon being laid down it whined, and towards evening had crying spasms, repeated at short intervals during the night. Dr. Leach saw the patient next day, and I accompanied him later, when we found it comatose, thumbs flexed, surface livid, frothing at the mouth, etc.; convulsions had continued from time of seizure. It died 15 minutes after our arrival, having been sick 26 hours.

*Autopsy* 28 hours after death. Navel had fallen off the day it was seized, leaving the usual raw surface otherwise healthy. The right side of occipital bone was overlapped by the parietal, while the opposite was the case on the left. Pia mater of brain and cord deeply injected, mostly in posterior portion of former, with dotted extravasation; large clots in longitudinal and lateral sinuses. A bloody gelatinous fluid lined the spinal canal.

CASE XIII.—Infant of L. B., coloured, male, eighth month utero-gestation, delivered by forceps Sept. 16, 1879; was well up to morning of 21st, when it was taken with what the mother called a choking spell. I saw the patient next day with Dr. Leach; the course of symptoms exactly corresponded with case above. Death took place in the evening 28 hours from beginning of attack.

*Autopsy* 30 hours afterwards. Navel nearly healed. In this case the left side of occipital bone was overlapped by parietal, the reverse on the right. Same condition of brain and cord as foregoing.

CASE XIV.—Infant of A. H., coloured, male, born 23d Sept. 1879. Mother died the same day of puerperal convulsions after 60 hours labour. The child continued well up to morning of 3d October, when it had short respirations, and commenced to draw itself up and clench the fists. At 11 o'clock refused the bottle, convulsions soon ensuing, continuing until death 64 hours from attack. I saw this child with Dr. Leach on the second day; and although it was too late to expect recovery, I am convinced that the change of position prolonged life.

*Autopsy* showed congestion of lungs, brain, and cord.

CASE XV.—Infant of S. K., coloured, well-developed male, fourth child (one died of this disease two years before), born Oct. 6th. Was well up to the 13th, when it refused breast. Navel fell off fourth day, leaving a healthy surface; fretting, crying, and jerking first symptoms noticed. Paroxysms would last about ten minutes, and recur every five minutes, the patient becoming weaker at each successive one. Died in a spasm, sick 30 hours. Nursed heartily once during the disease.

*Autopsy* showed marked congestion of pia mater, and clots in posterior fossa and cerebellum. Coagula lined spinal canal. Other organs healthy.

CASE XVI.—Female infant of M. D., coloured, born Nov. 22, died Nov. 28, 1879. Was seized on the fifth day, sick 24 hours.

*Autopsy* 60 hours after death. Soreness of umbilicus, confined to surface. Spinal cord lined with coagula, and a few clots on posterior lobes of cerebrum and cerebellum. Other organs healthy.

CASE XVII.—Infant of M. G., coloured, female, 7 days old, died Jan. 14, 1880, 24 hours from seizure. Usual history.

*Autopsy* in 16 hours. Hypostatic congestion of posterior portion of lungs. Pia mater of brain intensely injected, with a few hemorrhagic spots. Spinal canal lined with coagula.

CASE XVIII.—Infant of P. W., coloured, female, died Jan. 26th, five days old, sick 28 hours. First symptom refusal to nurse.

*Port-mortem* showed extensive clots in brain and spinal canal.

CASE XIX.—Infant of J. S. T., coloured. female, 6 days old, died Jan. 28, 1880, 33 hours from seizure. Symptoms and post-mortem appearances same as preceding.

CASE XX.—Female infant of M. J., coloured, 7 days old, ninth child of healthy parents, only one living; from the symptoms narrated, it was evident four died of the disease within two weeks from birth. This child nursed well up to the sixth day, and died in 16 hours. A curious feature was the absence of usual paroxysms of convulsions, the principal characteristic of the disease present being the locked jaw, accompanied by indistinct moans and whining.

*Autopsy* 30 hours after death showed the occipital bone overlapped on the right side by the parietal, the reverse on the left. The frontal bone in precisely the same relation, probably by some accident, impinged upon and pressed down the cranial contents. The membranes and substance of the brain and sinuses were intensely engorged, the cord also, but no extravasation. Umbilicus healthy. Others organs normal.

CASE XXI.—Infant of S. H., coloured, female, born Jan. 25, died Feb. 2, 1880, sick 24 hours. Usual history of symptoms.

*Post-mortem.* Clots above and below cerebellum, and in spinal canal.

CASE XXII.—Infant of A. J., male, coloured, 9 day old, sick 24 hours.

*Autopsy* in 30 hours. Lungs and brain congested; extravasation in spinal canal.

CASE XXIII.—Infant of C. P., male, coloured, age 5 days, died Feb. 4, 1880, 24 hours from seizure. Usual symptoms.

*Autopsy* in 30 hours. Injection of pia mater, and dotted extravasation of brain. Spinal cord lined with coagula. Other organs normal.

CASE XXIV.—Infant of J. G., coloured, first child, healthy, well developed male, born Dec. 13, died Dec. 20, 1881. First symptom noticed refusal of breast the 5th day, when mother found the jaws locked, and in forcing with a spoon nourishment was returned. Soon the child commenced to quiver, double up its fists, foam and fret, and grunt and cry and whine, and roll the eyes, which train of symptoms continued with usual aggravation, stridulous breathing, and opisthotonos. There was tonic rigidity throughout, and during the clonic spasms the sufferer, a mulatto, would turn dark-purple. The only intermission of these symptoms occurred the night before death, when it had three hours' sleep, occiput pressing on mother's arm (its general position since birth, as she informed me). Awakening in a clonic spasm, gradually became weaker, it passed imperceptibly away, 36 hours from seizure.

*Autopsy*, assisted by Dr. A. A. Hoehling, U. S. N., 44 hours afterwards, showed marked occipital depression. Navel perfectly healthy. The pia

mater of brain, posterior meningeal and cerebral vessels and sinuses, turgid with black blood; the spinal veins were also injected with slight dotted extravasation. Lungs intensely congested, probably, due to severity of paroxysms, which produced asphyxia and death.

CASE XXV.—Male infant of A. B., coloured, primipara, born March 21, died March 27, 1882. Was well up to fourth day, when seized with usual symptoms; died in 36 hours.

*Autopsy* showed congestion of brain, cord, and lungs. Umbilical arteries and vein healthy throughout.

CASE XXVI.—Infant of D. C., coloured, male, born May 16, died May 27, 1882. Seized with the disease May 23d, first symptom, refusal of breast. A physician was called the day following, who prescribed salve for "a moisture, or ulceration of the umbilicus," but he did not see the patient again; there was no mitigation of symptoms.

*Autopsy* 24 hours after death in presence of Dr. Hoehling. Navel normal. Thumbs still flexed and inward arching of feet. Apex of occipital bone dislocated and depressed a quarter of an inch, but right parietal overlapped more than the left; occipito-frontalis muscle and scalp very livid; bowels somewhat stained by bile. Lungs congested, more in lower lobes, and nearly collapsed—lower lobes almost sunk in water. Umbilical arteries and vein perfectly normal. Posterior surface of cerebrum and cerebellum loaded with coagulated blood; surface of brain intensely congested. Spine also lined with coagula. (The mother of this child lost her first of same disease 13 months before; was nine days old—sick one day.)

CASE XXVII.—Another case, coloured, male, 4 months old, that I examined about this time, was very much emaciated, and with nothing else abnormal except congestion of the brain and cord. It ran the usual course, and there was apparent depression of occiput. On questioning the mother as to whether the child generally lay in her arms while asleep, she said, "I had seven children, and didn't use them to that, because it made them so cross—they cry all the time, and want you to hold them."

CASE XXVIII.—Infant of G. R., coloured, female, fourth child (two others died of the disease), taken sick on the seventh day and lived 10 hours; paroxysms almost continuous and extremely violent.

*Post mortem* in 32 hours. Umbilical vessels normal. Lungs congested, the left collapsed; right auricle of heart distended. Pia mater of brain slightly congested. Spine lined with reddish gelatinous matter within theca—removed for microscopical examination by Dr. Griffith. Cause of death asphyxia from severity of spasms.

CASE XXIX.—Infant of A. B., coloured, female, one of twins born Feb. 1, 1883. When eight days old the mother was driven out of her room at the point of a pistol, and in running up stairs with both infants she thought she knocked the head of this one against the wall. On the following day it was seized with the disease, and died on the 14th. During its five days' illness the child could not take the breast, and regurgitated everything given with the spoon.

*Necropsy* in 30 hours. Umbilicus and organs of chest and abdomen healthy. Pia mater of brain congested posteriorly, reaching up to the vertex. Cord lined with coagula; removed for examination by Dr. Griffith.

CASE XXX.—Female infant, coloured, second child, born Feb. 11, 1883; labour lasted 20 hours. Was well up to about noon of 16th, when it awoke crying, and soon refused to nurse, spasms following six hours later. These continued in quick succession until death next morning.

*Autopsy* in 5 hours. Navel healthy. Lungs highly congested. Pia mater of brain congested, also the cord, with slight extravasation, which was taken to Dr. Griffith for examination.

CASE XXXI.—On the 15th April, 1883, I made autopsy of another boy of mother, Case XX. He was seized on the sixth day and died within 24 hours. The apex of occipital bone was bent inwards from the protuberance (like the other), forming a very decided ridge more on the right side. Experiments showed this to be one of those cases where an operation could not avail, on account of the probable difficulty in retaining the inwardly arched bone *in situ*. Indeed, there was an evident line of demarcation, or want of union between the point of ossification here and the protuberant portion. Another interesting feature of the case was a small abscess of both umbilical arteries opposite the fundus of bladder; a probe easily passed from it through the navel, which had apparently healed, but there was no congestion or inflammation of peritoneum surrounding. Left lung was intensely engorged. The normal bright pink appearance of the upper lobe of right lung was in marked contrast with the dark congested state of the middle and lower ones. The surface of brain was much engorged, with slight extravasation in the posterior lobes and cerebellar fossæ. Spinal cord lined in its anterior, and chiefly lower portion, with reddish gelatinous matter, which has been seen, but not noted in many of the other cases examined by Dr. Griffith.

CLASS III. CASE XXXII.—This, an almost parallel case to that of the child of Mrs. C. (Case I. Class I.), I saw, through the kindness of the coroner, Dr. Patterson. Being called to give a certificate of death, his attention was directed to a sick child, male, of S. W., about four months old, lying in a crib. He made an examination of the head, and endeavoured by manipulation to adjust the occipital, which he found overlapping the parietal bones, but failed to do so.

Arriving at the house, the mother informed me that her baby was sick since birth, never having had a well day; that it constantly fretted, whined, or cried, and would toss about and feebly beat its head, refuse nourishment, etc.—it had not grown at all, and was not much more than a skeleton. This history was but a tame expression of the child's suffering; its truth was too plainly told on the shrivelled, painful countenance, and although four months old it had not attained the average weight of an infant at full term. My examination of the head confirmed the character of displacement reported by Dr. P. I found the right parietal bone more deeply overlapped, firmly locked, and impossible to release by manipulation. The child was so low I explained to the mother the necessity of immediate interference, even by an operation. (The one I proposed to perform is Dr. Harrison's, described by Dr. Sims, which simply consists of the introduction of the point of a knife cautiously, to pry out the bone.) The husband not being present to give his consent, I deferred it till the next day if the child was then living. It died, however, during the night. No post-mortem was permitted.

CASE XXXIII.—Infant of C. T., coloured, male, died Jan. 10, 1879, twelve hours after birth; seized with convulsions immediately after delivery, continuing until death. Marked inward displacement of occiput.

CASE XXXIV.—Male child of Mrs. P., white, well developed, born January 4, died January 11, 1879. Parents well-to-do Germans, residing in a dry, healthy part of suburbs; third child they lost by this awful mal-

ady, the first living but one day, the second but four days. Mrs. P. informed me she had no attending physician; that the baby thrived well until the fifth night, when it refused the breast, and soon afterwards had a crying fit. She showed me how she sat up with it in bed, the occiput resting on her thigh. (About three years ago a fourth was born. On meeting the mother a few months since, she thanked me for my suggestions and explanation of the cause of the disease, as she believed this last child was preserved on account of such knowledge.)

CASE XXXV.—Female child of B. T., coloured (mother of seven children), born January 13, 1879: taken sick fourth day, died in fifteen hours—refusal to nurse first symptom. I could not obtain an accurate history. There were "inward spasms," however, and stretching of body and limbs, "head burned up with fever." For an hour or more pressure on the occiput was probably accidentally relieved, as the child nursed once heartily, symptoms recurring after laying it down.

CASE XXXVI.—Infant of M. A. M., coloured, perfectly developed healthy female, born January 8, 1879, died January 16, after thirty-three hours' illness. Was well up to night of 15th, when the first thing noticed she refused to nurse. Upon being laid down, it shrieked, whined, and had crying fits, and jerking spasms. During fits the head was thrown back, mouth frothing, countenance frowning, fists doubled up or locked in front of breast. The nurse explained that when sitting up in the arms there would be a temporary subsidence of symptoms, but when she placed it in her lap they became aggravated. This led me to ask the exact position of the child when in her lap, which she illustrated with another child, showing me clearly that the whole weight of the head had rested on the occiput across her knee. During the course of the child's sickness it would repeatedly try to take the breast, jaws were stiff, eyes alternately open and shut, and no sleep from the time of attack. Navel looked healthy. Inward displacement of occiput.

While in the room investigating the case, one of the women present remarked that when she laid her child on the back, "it looked like it was dead, and would seem strangled, until I rushed and changed it on the side." Another said she lost hers by crying fits on the ninth day, after thirty-six hours' sickness, one of the first symptoms she observed being that the child would wake in fright and jump, after being laid on the back for some time.

CASE XXXVII.—Another case of trismoid was the adopted child of J. T., white, male, five months old, where I was called January 20, 1879, through the courtesy of Dr. Patterson. This case also presented the appearances of hydrocephalus, the picture of suffering being depicted in countenance, even after death. History exactly similar to the others. Parietal bones overlapping occipital.

CASE XXXVIII.—Infant of J. H., female, white, born Jan. 26, died Feb. 1, 1879. This child was puny from birth, and was not able to take the breast, although it repeatedly made efforts to do so. When laid on its back, or held by the mother, the head resting on her arm, it would whine and "have fits of little jumping." On the 30th, it refused nourishment entirely, the next day became worse and died. I took pains in this case, again, to see the exact manner in which the child was held, the result showing that, as a rule, the occiput rested on the arm or lap.

CASE XXXIX.—Infant of L. T., coloured, female (seventh child—three stillborn—and from the history given, one of the others died of trismoid,

three months old), born Feb. 1, died Feb. 12, 1879, sick 24 hours. Born with convulsions, which continued till next day, then nursed heartily until they recurred on the 11th. The mother, on noticing the fixed jaws, from that moment gave the child up; life went out imperceptibly.

CASE XL.—Female infant of S. M. coloured, born Feb. 14, 1879, although fully developed, was never well; the first night had quiverings, groaned and fretted. It continued in this condition until the 20th, not having nursed at all, when convulsions ensued, following in rapid succession until death on the 22d. "The child during the attacks would froth at the mouth, become stiff, and turn blue."

CASE XLI.—Female child of E. H, seven days old, third lost by this disease; attacked the fifth day. Usual symptoms; died in 36 hours.

CASE XLII.—I was called on the 22d Feb. 1879, to see the female infant of J. T., coloured, seven days old. I found it in a characteristic spasm, lying on its back in the lap of an old midwife. I took up the child, examined the occiput and found it overlapping the parietal on the left side, while the reverse was the case on the right. By this time, the convulsions ceased, and the face and neck gradually resumed a natural tinge. After persevering manipulation, I relieved the displacement to a marked extent, and for more than half an hour it continued comparatively calm. The mother told me this was her third baby, the labour lasting only three hours. Her first had had spasms when two weeks old, but recovered, and had them again in a month, when it died. She pointed me to her second, a bright healthy-looking child about two years old, who also had spasms when an infant. The baby in question was strong and vigorous, and nursed heartily up to 7 o'clock the evening before I was called, when suddenly it commenced to fret and stretch itself; it "got weak in the jaws" about 9 o'clock, and refused to nurse. She gave colic mixture for the "rumbling of wind in the stomach," but it continued fretting and jerking, and getting worse all night. The first severe spasm occurred about 6 o'clock, since which time up to my arrival (eight hours after), they continued every half hour, lasting over five minutes.

Upon directing my attention more closely to the patient, I found it was in a comatose condition; the eyes and hands were shut, the thumbs firmly grasped between the two first fingers, the pupils contracted, requiring force to examine them. There was nothing unnatural about the bowels or urine. Before leaving, I gave directions as to proper position. In the evening the child continued unconscious, although there was no aggravation of the other symptoms, until just after my arrival, when a severe paroxysm occurred, from which it seemed impossible to recover. Gradually, a deep lividity spread over the face and whole body, and it lay, painful to behold, bent in the position of opisthotonos; this quietly passed off, being quickly succeeded by little jerkings. The respiration was now hurried and irregular, and pulse imperceptible, jaws continued fixed and tongue tightly held between the gums. In this condition it lingered till the following day. I had the theory from the first that extravasation had taken place early upon the brain and spinal cord, which accounted for the comatose condition and opisthotonos, and change of position nor anything else could have saved life. No post-mortem permitted.

CASE XLIII.—Infant of M. L., male coloured, born Feb. 26, 1879, 23 days old. First had spasms when a week old, which passed off without treatment. It nursed and continued well up to the evening before death, when "it commenced to draw itself up and look as if something hurt it

inside; no passage from the bowels but straining and rumbling of wind; jaws were weak—had snuffles and grunted—rolled the eyes and doubled up the fists in spasms." Occipital depression well marked. No history of soreness of navel.

CASE XLIV.—Male child of L. S., four months old, light mulatto, was attacked on the 23d March, 1879. Indifference to breast, low whining, jerking, etc., first symptoms noticed. These continued aggravated from day to day, until the 31st, when Dr. Leach was summoned. I accompanied him in the morning, and found the child's head almost at right angles with the trunk, presenting the most marked case of opisthotonos I ever saw. It was in the mother's lap, occiput resting as usual on the arm. Examination showed occipital depression, the left side being more overlapped. I placed it on right side lengthwise on a pillow, and continued to watch it a few minutes, when the old granny said that was the first rest it had since taken, adding that, when lying in her arms or lap, it was all the time a whimpering, kicking, and seemed uneasy. Although the child was four months old, pressure on the occiput with the finger produced at will an aggravation of symptoms. It was so exhausted when we arrived, that death followed in a few hours.

CASE XLV.—Female child of M. G., coloured, born April 9, 1879. Was well up to evening of 14th, when the first thing noticed was hoarseness, then refusal of breast, spasms occurring 12 hours later. The disease ran an acute course with usual symptoms intensified, death following 20 hours from seizure. The lambdoidal and sagittal commissures were fully one-fourth of an inch wide.

CASE XLVI.—Male child of L. C., coloured, seven months old; never seemed to be well. I saw the case on the 12th April, and found marked displacement of occipital bone. It was very much emaciated, and lay in an occipito-parietal position, grunting and jerking, eyes fixed, and thumbs flexed on the palm. The whole body was rigidly curved backwards. The child was in articulo mortis, and died the same evening.

CASE XLVII.—Male child of J. D., white, aged 5 days, born April 24, in an elevated and healthy portion of the county; died April 29, 1879. This child commenced to nurse on the 26th, continuing regularly until midnight of the 28th, when its refusal was the first symptom noticed; the day before, however, it was observed to moan when asleep. The mother laid it generally on her arm, either on the back or side. After the refusal to nurse, it would cry and be fretful, draw itself up as if it had cramps, would clench its fists, and froth at the mouth; it was then discovered that the jaws were fixed, and the child could not swallow, a soothing mixture being returned, mixed with froth. The first convulsion occurred 8 hours after the refusal to nurse, and they continued about every half hour, lasting sometimes ten minutes; towards the last they came on every five minutes. During these paroxysms the face and neck were particularly livid, and the head rigidly thrown back. Illness lasted 24 hours.

There was marked occipital depression and "looseness" of cranial bones, from deficient ossification. No inflammation of umbilicus. The mother observed that when laid on its side flat on a pillow, there was a general lull of symptoms. The robust health of the parents, the scrupulous cleanness, and the remarkably healthy surroundings were especially noticeable.

CASE XLVIII.—Infant of S. G. C., coloured, female, born Nov. 4, 1879, was well up to night of the 10th, when, after being nursed and laid down, awoke in about an hour fretting and crying. The mother tried to

quiet it by offering the breast, which was refused. There was not much change until early morn, when the first spasm occurred; symptoms ran usual course, death taking place 33 hours from attack. I saw the case six hours afterwards. Occiput very much depressed; indeed, it could not be otherwise, on account of the lack of development of the bones, allowing nearly half an inch space at their junction, which gave a loose baggy feeling to the head.

CASE XLIX.—Infant of M. G., coloured, male, born Dec. 7, 1879. I was called to see this case on the sixth day from birth. The mother told me it was well and hearty up to the evening of the 12th, when it was taken sick with a pain in the stomach, and crying, soon commenced to stretch himself and draw his arms up. He went to sleep for an hour or two, and, on awaking, "looked as if he had a stopping in the head, was a kind of choked, and couldn't get his breath" (stridulous breathing). At times he turned black in the face, and she would try to nurse him, but he couldn't take hold; he continued to snuffle and choke and strangle. The first spasm occurred about 8 o'clock, being repeated every fifteen or twenty minutes, and lasting one into another. In this condition I found him. The paroxysms were so severe and well marked, accompanied with lividity and opisthotonos, that extravasation had too evidently taken place. I put him on the side, and attempted to feed with spoon, but the power of deglutition was gone. Death occurred during the night, thirty hours from attack. Examination before death showed plainly depression of the occiput on left side, and the natural relation of the bones on the right. Navel had sloughed off on the fourth day, leaving a perfectly healthy surface.

The following tables represent the mortality for four years of cases under 30 days coming under the Coroner's jurisdiction.

| Year. | White. | | Colored. | | Age. | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | Under 1 day. | 1 day. | 2 days. | 3 days. | 4 days. | 5 days. | 6 days. | 7 days. | 8 days. | 9 days. | 10 days. | 11 days. | 12 days. | 13 days. | 14 days. | 15 days. | 18 days. | 21 days. | 25 days. | 30 days. |
| 1879 | 5 | 3 | 23 | 31 | 6 | ... | 2 | ... | 1 | 10 | 7 | 14 | 4 | 6 | 2 | 1 | 1 | 1 | 5 | 1 | ... | 1 | | |
| 1880 | 2 | 1 | 30 | 31 | ... | 1 | 2 | 4 | 3 | 13 | 7 | 14 | 6 | 3 | 2 | 1 | 2 | ... | 3 | ... | ... | 1 | 1 | 1 |
| 1881 | 4 | 2 | 29 | 14 | ... | 2 | 1 | 4 | 1 | 1 | 6 | 8 | 9 | 3 | 1 | 4 | ... | 1 | 3 | 1 | ... | 2 | ... | 2 |
| 1882 | 2 | 1 | 31 | 20 | ... | 2 | ... | 2 | 1 | 9 | 10 | 13 | 3 | 5 | 1 | 1 | ... | ... | 3 | ... | 1 | 3 | | |
| Total | 13 | 7 | 113 | 96 | 6 | 5 | 5 | 10 | 6 | 33 | 30 | 49 | 22 | 17 | 6 | 7 | 3 | 2 | 14 | 2 | 1 | 7 | 1 | 3 |

*Monthly Mortality.*

| Year. | Jan. | Feb. | March. | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1879 | 7 | 8 | 4 | 3 | 4 | 6 | 4 | 2 | 7 | 8 | 5 | 4 | |
| 1880 | 5 | 9 | 5 | 5 | 2 | 10 | 6 | 3 | 7 | 4 | 6 | 2 | |
| 1881 | 5 | 4 | 3 | 2 | 1 | 2 | 7 | 3 | 6 | 6 | 8 | 2 | |
| 1882 | 4 | 5 | 3 | 3 | 8 | 2 | 3 | 2 | 8 | 6 | 4 | 6 | |
| Total | 21 | 26 | 15 | 13 | 15 | 20 | 20 | 10 | 28 | 24 | 23 | 14 | =229 |

It will be seen that, during the six warm months, viz., April, May, June, July, August, and September, 106 deaths occurred, or nearly one-half of the whole number, showing that the disease does not prevail in any one season more than another, as claimed by some authors. It will be further noticed that the term "9 day fits" is a misnomer, as only 17 of the 229 died on the ninth day, or 7.4 per cent. That sex has nothing to do with the disease will be observed also from the table, the small increase of males being merely in proportion to general statistical results.

The coloured element largely predominates; but this again only bears a general ratio to other diseases, and does not arise from any "peculiar organization" or "hereditary tendency." For, according to the annual statement of deaths of all ages certified by the coroner for 1879, one of the years mentioned, although the white population was two to one, of the whole number (625), 484, or 77.4 per cent. were coloured. Another important factor which swells the mortality among coloured infants is, that many mothers being employed during the day, their babies are neglected, or left to strangers, and very often allowed to remain hours at a time in a crib, generally on the back. It is proper to say that the table includes a large number reported as "convulsions," whose history was exactly the same; this was done pending these investigations, and following the usage of other physicians. To a great many in general practice trismus is an obscure disease; an infant is found in a paroxysm of convulsions, and the death certificate so records it.

The following shows the age, when seized, of 209 cases: At birth 15, 1 day 2, 2 days 13, 3 days 10, 4 days 39, 5 days 34, 6 days 35, 7 days 17, 8 days 9, 9 days 8, 10 days 7, 11 days 6, 12 days 3, 13 days 3, 14 days 1, 17 days 2; 18, 19, 20, 23, and 28, 1 each. (Of those sick from birth 1 lived 30 days, 1 7 days, 1 5 days, 1 3 days, 1 36 hours, 1 33 hours, 3 1 day, 1 17 hours, 2 12 hours, 1 10 hours, 1 5 hours, and 1 1 hour.)

Of the 229 in the table, the duration of disease of 207 only could be ascertained, as follows:—

1 lived 1 hour; 1, 2 hours; 1, 6 hours; 1, 10 hours; 2, 12 hours; 1, 14 hours; 2, 15 hours; 2, 16 hours; 1, 18 hours; 74 about 1 day; 1, 28 hours; 1, 30 hours; 2, 33 hours; 1, 34 hours; 8, 36 hours; 66 about 2 days; 24, 3 days; 9, 4 days; 1, 5 days; 1, 6 days; 4, 7 days; 1, 11 days; 1, 14 days; 1, 30 days.

The table below shows the mortality under a month, during the same period, from all other causes combined, such as violence, congenital debility, premature delivery, etc., not including stillbirths.

| | White. | | Coloured. | | |
|---|---|---|---|---|---|
| Year | M. | F. | M. | F. | |
| 1879 . . . . . | 13 | 14 | 39 | 32 | |
| 1780 . . . . . | 12 | 5 | 29 | 31 | |
| 1881 . . . . . | 6 | 4 | 32 | 27 | |
| 1882 . . . . . | 12 | 7 | 39 | 39 | |
| Total . . . | 43 | 39 | 139 | 129 | = 341 |

This demonstrates only a trifling difference in the percentage of males (55 to 52$\frac{4}{3}$) compared with the trismus table, and ought to dispose of the latest theory that adherent prepuce is largely the cause of the disease. The increase of whites in this Table is due no doubt to the equal likelihood of accidents and violence, as it includes chiefly the poor, or those in the same station that the coloured represents.

Now, with regard to the identity claimed between this disease and tetanus in the adult, it will be apparent that the statistics presented do not confirm this view. It is also disproved by the comparisons of Dr. Sutton and others, previously given. Holmes mentions 277 cases of traumatic tetanus, of which only 130, or 47 per cent., were seized within ten days after the injury. I was enabled to learn the time of seizure from birth in 209 of my cases of trismus, of which number 189, or 90 per cent., were under 10 days; while of the 88 reported by Stadfeldt, only one survived the 10th day. Matuszynski's 25 were all seen before the 9th day; and 107 of the 114 of Clarke's died before the 9th day.

In a table of 327 fatal cases of tetanus in the adult, also reported by Holmes, 79 succumbed within two days, or 24 per cent. I ascertained the average duration of sickness in 207 of my cases to be 50 hours, of which number 165 lived two days and under, or about 80 per cent., and 86 lived one day and under, 41.6 per cent.

Another point in refutation of this claim of identity is the fact that in the tetanus of the adult febrile excitement is not essential, and if present is only secondary. Indeed, O'Beirne states that of 200 cases observed by him, not one was accompanied by fever. In every instance of trismus nascentium where I took the temperature, when the disease was at its height, I found an elevation; one case that I saw with Dr. Shadd of the Freedman's Hospital reaching 105.4°.

Neither are the post-mortem appearances alike. The brain, medulla, and cord have been found in various conditions in the adult, but very rarely if ever have coagula been seen, although universally present in the infant. The similarity of these diseases in other respects I admit, but their etiological relation I deny. The principal basis of identity claimed is the trauma necessarily inflicted in the cutting of the cord at birth, irritating dressings, etc., to navel, which is supposed to correspond with the wound in the adult.

An analogy to eclampsia has also been claimed by some writers. In this connection the following remarks of Dr. J. Lewis Smith accord with my own observation. After describing mode of attack and paroxysms of eclampsia—which differ widely from trismus—he says:—

"Death does not ordinarily occur from one attack. There are several at intervals, during which the stupor is gradually becoming more and more profound, till finally there is total loss of consciousness and sensation. This is the most frequent mode of death, namely, from coma. . . . The only disease for which there is danger of mistaking eclampsia is epilepsy. (We all know what a

far remove this is from trismus.) M. Ozanam mentions the following means of distinguishing the two: 'Eclampsia differs from epilepsy in the frequent occurrence of prodromic symptoms, the clonic form of the convulsions, the rare appearance of froth in the mouth, the absence of a hideous aspect of the countenance, the spasmodic and sobbing character of the respiration, and a state of quiet without snoring which succeeds an attack. Eclampsia consists in a rapid, forcible, and involuntary muscular contraction *alternating with relaxation.*' In trismus there is generally tonic rigidity throughout."

Another difference: "Eclampsia occurs at any period of infancy and childhood, and is either idiopathic, symptomatic, or sympathetic. The most common cause, however, of clonic convulsions is the presence of some irritant in the primæ viæ. Dentition, worms, etc., are also causes."

With regard to trismus he says: "To one who has seen this disease in the new-born, or is familiar with its symptoms, diagnosis is easy. The symptoms which possess diagnostic value are more manifest and reliable than in most other infantile affections."

The symptoms of congestion of the brain, or apoplexy, have likewise been advanced as analogous, but the inability to suck, pointed out by Dr. Sims, must be regarded as pathognomonic of trismus nascentium. An equally unfailing sign that I have observed is opisthotonos, which *invariably* accompanies congestion or extravasation of spine, and is not present in congestion of the brain.

The umbilical cord has been the most generally accepted cause of the disease, because in many instances—probably from the twistings and contortions during paroxysms—a lesion of this sort has been found associated; but it has been also shown that extensive inflammation here has not produced a single symptom of trismus nascentium. Every physician observes tenderness or redness of the navel, and knows that this is only the normal state attending the process of sloughing, or the few days following. How common it is for his attention to be called to the "baby's navel not healed yet," or "something is the matter with baby's navel," but does he find trismus? Chanier (*L'Union Méd.*, 1879) gives the case of a *healthy* infant born at full term, in whom the cord was green and red, flattened, and as if belonging to a still-born fœtus. In a five weeks' old infant that died of asphyxia from being accidentally overlaid, I found coagula and yellow matter lining the outer portion of the commencing obliterated umbilical arteries, while the inner were glistening white and healthy, but this coagula is only the well-known physiological effect of the ligature. The areola around the umbilicus was nothing more than the stain of bile and decomposition.

When inflammation of the cord, with or without suppuration, is present, it sometimes extends inwards, producing convulsions and death. These cases are liable to be mistaken for trismus, and in a few I examined there was generally peritonitis, but no extravasation along the spine. I have also examined several infants, under a month old, who died of other diseases, with a like absence of extravasation. Dr. Mildner, of Prague, who has recorded the results of 46 cases of fatal inflammation of the umbilical vessels in children born in the lying-in hospital of that city, states that

convulsions occurred in only five of the number, and that in no instance had these convulsions the least resemblance to those which characterize trismus. Dr. Thore says: "With regard to the umbilicus, the condition described by authors may be produced or developed during the disease. In my experience there is nothing more common than inflammation of umbilicus, and nothing more rare than trismus."

Dr. E. Goldmann, of Texas, says that he has seen many cases in which no lesion of any kind could be traced to the navel. On the other hand, he had seen a number of children with navels ulcerating for weeks with considerable tumefaction and redness around, and yet without tetanus intervening. According to Gaillard, the soreness of the umbilicus cannot be regarded as the peculiar pathognomonic lesion, since it is so frequently observed without the supervention of trismus. Dr. Hancock, of Edinburgh, is opposed to cutting the cord, on the ground that it produces the disease; while some observers in the Southern States found the practice of not cutting the cord was limited to a stray midwife, and was invariably attended by fatal results.

Another point which the advocates of the umbilical theory seem to have overlooked, is the fact that no nerves have been traced to the cord. Who has ever observed the slightest evidence of pain or uneasiness in tying it? How then can the "reflex irritation" of Baldwin be explained? Dr. Woodworth, of Miss., while not advancing any theory as to the cause of the disease, thought that "physicians who attribute it to tying or dividing the funis improperly, must forget that the funis is not supplied with nerves."

Dr. Sutton, replying to the position taken by Dr. Watson, says, "but I do not suppose Dr. W. means that the wound inflicted on the cord, *per se*, ever gives rise to trismus. We know of no nutrient vessels in it, no nerves to direct vital operation." Among my own endeavours to ascertain something satisfactory on this point, I addressed a letter to Dr. Francis Delafield, of New York. His reply was, "I have no knowledge concerning the nerves of the umbilical cord."

If anything more is necessary to refute this umbilical theory, I invite attention to the following extract from a lecture by Edmund Owen, F.R.C.S. (*Brit. Med. Journ.*, i. 1880):—

"I will now allude to a strange condition of the umbilicus, of which I have seen a good many examples. Close around the cicatrix is a red and irritated or eczematous patch of skin, whilst from the depths of the umbilical fossa oozes a thin purulent fluid. For the cure of this affection lotions and all other kinds of dressings avail nothing; for, at the bottom of the depression, and hidden by overhanging folds of skin, there is a small fleshy polypus which has sprung up from the scar of the fallen umbilical cord."

This description would seem to accord with that given with so much minuteness by Colles and Von Busch, and claimed by them to have been the cause of trismus nascentium.

The next prominent theory in the etiology of the disease is cold or draughts of air. It is well known that the gentlest zephyr will very often seem to renew the paroxysms. I do not believe that it can produce the disease *per se*. On the contrary, a more natural result would be bronchitis, and like inflammatory conditions in such an active capillary system as the infant's.[1]

It seems unnecessary to dwell on the numerous other causes ascribed as producing this disease. It has been shown that climate or season exerts no special influence. Dr Goldmann attributed a case to neglect in shutting the windows before a storm, and claimed that the disease prevails on islands in proximity to the sea more than elsewhere; yet, according to West, we have an example of almost entire immunity in Ireland. Another writer (Gaillard) starts out with the assertion that it is well known to be more common in warm than in cold climates, and before his article is finished the statement appears, "the disease is most frequent in the cold, damp, and variable months of winter and spring." While Watson ascribes the predisposing causes to indigestion, heat, etc., and that "it attacks so frequently on the ninth day after the cutting of the funis that it has been termed nine-day fits."

This brings me to the final consideration of the purport of this paper, viz., the establishment of the true cause, and the prevention and cure of trismus nascentium. After the publication of Dr. Sims's articles, cases

[1] Cold, as a cause of simple congestion of the spine, is, however, generally interesting. I do not deny its possibility to produce many of the symptoms of this disease. But as age advances, with the corresponding development of the nervous system, it must manifest its influence in a more varied form. A peculiar case of hysteria in a young girl, accompanied with paralysis of cervical muscles, reported by Dr. D. W. Prentiss before the Medical Society of the District of Columbia last spring, was clearly attributable to a long ride in an open buggy, the nervous symptoms following, or being associated with an acute synovitis. This suggested to me that hysteria is often an effect of local or circumscribed congestion of spine, and that in cases arising from this cause, our treatment is often radically wrong. Generally, local congestions, in persons otherwise healthy, are a sequel of cold. We have inflammation of one lung, lobular pneumonia, or any acute inflammatory condition from this cause, always preceded by a stage of congestion. And why should not congestion, local or circumscribed, take place in the spinal cord as well as in any other organ or part of organ, as an impression or shock of cold, and remain passive say from absence of the peculiar tissue or vascularity that favours or develops inflammation? It seems to me this is the philosophy of hysteria following such a history, and when we have an aggravation of the mental and physical symptoms, could it not be accounted for by extension, or the impression being conveyed upwards to the medulla, pons, and brain? Such congestion, when long-continued, would produce exhaustion of nerve power by pressure around the crura, or origin of the optic nerve, accounting also for the temporary blindness sometimes seen in connection with these cases.

Assuming, therefore, that hysteria is an effect of minute or larger local congestions of spinal cord following the impression of cold, I repeat, is not the treatment of this condition often radically wrong? It would at least be curious to employ assafœtida, bromides, etc., instead of antiphlogistic measures for congestion or inflammation elsewhere.

were reported for and against occipital displacement. Those with whom the practice was successful naturally espoused the theory; while the majority seemed to have derived no benefit from such treatment. This was probably due to a want of true understanding and continued investigation of the subject. Dr. Sims said himself he had not explained every thing in conection with it; that his observations were but a small beginning. It is our privilege to give the results of four or five years' perseverance in the endeavour to elucidate this subject. The physiological explanation showing the effects of pressure on the base of the brain, so admirably described by Dr. Sims, which experiment I have myself repeatedly performed with entire satisfaction, leaves nothing more to be said on that point, except to add, that the duration and frequency of convulsions depend upon the degree of pressure. For instance, I have observed in the acute form, that when the convulsions continue a certain length of time, extravasation ensues and the case becomes hopeless. In cases of deficient ossification, where the bones are loosely attached by their commissures, or where the displacement is easily detected, the symptoms occur sooner, and are more aggravated, the majority dying in a few hours.[1]

Where one side is overlapped, the disease is milder; and when the displacement is hardly perceptible, the symptoms are apt to continue many days. These facts will be apparent from an analysis of the cases of Class II. and III.

To better understand the pathology and rationale of the production of the disease, it will be remembered that the child's head before birth has for its pillow the soft cushion of the liquor amnü. At birth, and for some time subsequently, the cranial bones are not united, are thin and without diploë. It is reasonable to suppose that the transition to a different usage will cause them to be easily displaced, or the occiput to be depressed, the degree and character depending upon position or management. The mother may allow the head to lie on her arm or lap during nursing, or the nurse may place it in a like position, or the child may be retained in the recumbent posture on a hard mattress, an old quilt, or a bunch of clothes, as Dr. Sims says, wadded up and stuck under the occiput. And here I may be permitted in illustration to offer a characteristic extract from one of Dr. Sims's cases.

"The mother said that there had always been great difficulty in getting the child to suck; that sometimes it could not draw the breast at all; and very often would stop before it got half through; and that this had been the case from the time it was a week old. I requested her to suckle it (it was now quiet; had been for some time lying on its side). She took it up from the bed and applied it to the

[1] This is the class that would accord with Dr. J. Lewis Smith's expectations that "if Dr. Sims's theory was correct, compression of the medulla would certainly be followed by immediate and marked symptoms." They are also cases in which there is little or no emaciation, and no consequent sinking of the bones to correspond with supposed cerebral waste.

breast. In doing this, the occiput fell precisely against her arm, as it supported the head; there was a difficulty in the child's laying hold of the nipple, and she attempted to force it into the mouth by pressing this firmly up against the breast. This plainly increased the difficulty, for the pressure of the child up to the breast, by the arm supporting the head, and acting upon the occiput behind, evidently produced a deeper displacement of this bone, and so every effort on the part of the mother, while she thus held the child, only aggravated the trouble.

"Seeing that there was no chance for it to suck in this way, I requested the mother to take her arm from under its head, while I would support it in my hands, gently and firmly compressing the parietal protuberances for five or six minutes, but with no pressure on the occiput; and it sucked with the greatest ease; indeed most ravenously. I then changed the pressure from the parietal to the occipital bone, and instantly the same difficulties occurred as when the head was resting on the mother's arm."

Another fruitful cause, especially of the chronic form of the disease, is the modern baby-carriage. A child is laid in this deep, narrow, coffin-like contrivance, pillow crosswise. The body as well as the head sinks in the middle; the child has no room to turn, and if it could, it would be in imminent danger of smothering from the raised pillow on either side. Arriving home after its jolting and head-jarring expedition, panting and fretful perhaps, it only needs a little improper handling (if the bones are not already dislocated) to inaugurate the disease; refusal of breast follows, then convulsions; a physician arrives, but the cause is not recognized; all sorts of remedies are employed; twitchings, convulsions, and other symptoms continue; finally, from overloading, the delicate blood-vessels give way, or more generally death is caused by an exhaustive diarrhœa. This is no fancy sketch, but an every-day occurrence. I can recall numerous instances, before this subject attracted my attention, that I know now could have been saved by position, when the death certificate recorded "tabes mesenterica," "meningitis," or "cholera infantum." Who cannot recall similar cases, where the little one was perpetually dosed, the symptoms persisting despite everything that could be done, or where perhaps they were relieved, and as the physician supposed, by the potency of the prescription, when probably it resulted from an *accidental proper position*, or after removal from a bath? Dr. Z. T. Sowers, of this city, and Dr. Luck, of Roanoke, Va., inform me that they have seen many such cases. A brother-in-law residing in the latter place, an intelligent, but not a medical man, wrote me a few months ago: "I really think if we had not had our attention called to the subject, that M.'s infant would have fallen a victim thereto. For several days it had many of the symptoms you describe, but the simple means indicated were apparently effective." In a conversation with Dr. John B. Hamilton, Surgeon-General Marine Hospital Service, he said, that when practising in Kane, Greene Co., Ills., in 1872, a child about two years old, of Elias Greene, living in the neighbourhood, had convulsions, which had continued at frequent intervals since birth, produced, it was thought, by deficient ossification of the cranial bones. Dr. A. B. Allen, who attended the case,

placed a *tight bandage around the child's head, and the convulsions, in a few months, entirely ceased*, the bones having become consolidated. Dr. Hamilton's statement was dependent upon the history as given him by Dr. Allen; but it was of common repute that the child was cured by the treatment, Dr. H. himself having attended other members of the family.

Of the many instances that I have lately seen in the incipient stages of the disease, all of which it may be said were controlled, one particularly occurs to my mind, where the mother, after allowing the child's occiput to rest on her arm all night, noticed next morning, among other symptoms, what she called swelling of the feet; this was nothing more than commencing rigidity. The child, plump and healthy, sucked indifferently, threw its head back, all the muscles becoming knotted; it regurgitated half a teaspoonful of water, containing one-twelfth drop tinct. aconite, which the mother insisted produced the spasm that followed. I therefore ordered other "medicine," consisting of chalk and sugar, and remained to see that a *proper position* was carried out. There was no further bad symptom.

Dr. T. N. McLaughlin, now of the Philadelphia Hospital, who gave me valuable assistance in many of these post-mortems, writes me as follows of a case occurring in that institution.

"My attention was called to Mary M., white, æt. 4 days. The mother stated that the child was very restless, refused to nurse, and she was unable to account for the sudden change in its condition. Upon inquiry, I ascertained from the mother that she was in the habit of resting the back of the child's head upon her arm, and of tossing it while lying in this position in order to quiet it. The child presented the following condition: The expression was one of intense distress. There was marked hyperæmia of the conjunctivæ, delirium, and throwing of the head from side to side. It had a few spasmodic contractions of the muscles, but no convulsion; the pulse was rapid and feeble. The cause being recognized, I immediately resorted to your mode of postural treatment, by placing the child upon a pillow, and on its side, so as to relieve the pressure from the overriding of the occiput. The relief was almost immediate. The child who was so restless before, now became quiet. This postural treatment was alone tried in order to test its merit, and I feel confident that the child's life was saved by immediately recognizing the cause and removing it."

As before mentioned, in many of the cases examined, I found a reddish gelatinous matter mixed with the coagula enveloping the cord, distributed mostly in the dorsal and lumbar regions. West also refers to its presence around the theca. This may correspond with the viscous mass or proliferation of connective tissue, which, according to Meigs and Pepper, is the constant anatomical lesion found almost exclusively in the gray substance. The condition I have described existed in a lesser degree in an infant that died from asphyxia by being accidentally overlaid. The difference is best shown in the following photomicrographs and report, for which I am indebted to the courtesy of Surgeon General P. S. Wales, U. S. N., and

P. A. Surgeon S. H. Griffith, U. S. N., who so successfully executed them. In the case of asphyxia, it will be observed that the vessels are limited and defined, while the profusion of coagula in the trismus plate is at once striking and conclusive.

Fig. 1.

Capillary vessels in lymph around spinal cord, child 5 weeks old (asphyxia). Magnified 175 diameters.

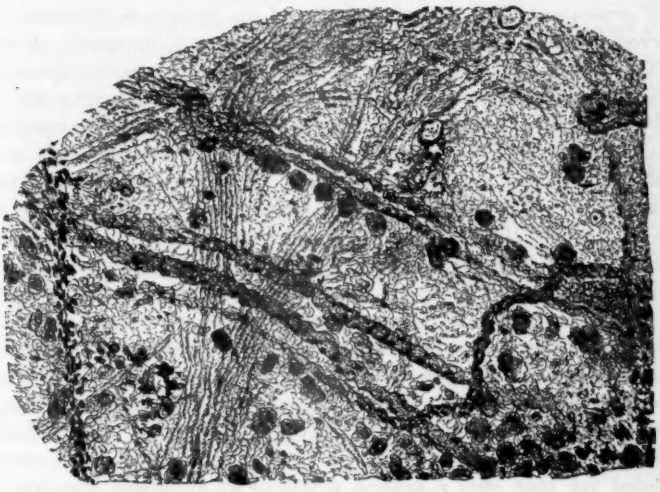
"In reference to the examination of five spinal cords received from Dr. Hartigan, the following report is respectfully submitted: Four of the specimens were from infants who had died of trismus nascentium, and one from an infant who died of asphyxia.

In the cavity of the arachnoid, more or less surrounding the cord in all the cases, was found a varying quantity of reddish gelatinous lymph. In three of the cases of trismus, abundant coagula were found in the same locality, less defined in the other. In the case of asphyxia, no coagula were found. Microscopical examination of the lymph showed it to be organized, containing abundance of capillary bloodvessels, with evidences of congestion observed in microscopic extravasations as well as turgescence of the larger vessels. This condition was found in the case of asphyxia as well as in the cases of trismus; in all the cases the lymph presenting precisely the same appearances, which are shown in the accompanying photomicrographs. No microscopical examination of the cords was made, but they presented the appearances of congestion."

When attention was first called to Dr. Sims's views, the efficacy of a plan so simple and promising such happy results was tested by many physicians. Some saw the patients soon after the first convulsion, and were able to rescue them; while the large majority arrived probably several hours, even days, subsequently, and of course as a rule could not

afford much relief. This is sufficient to account for the rejection of the theory. I myself confess to some disappointment until repeated observations made the cause clear. I found some instances where, on account of deficient ossification, or the looseness referred to, the symptoms were

Fig. 2.



Capillary bloodvessels in lymph around spinal cord, with coagula on right side, upper portion. Case of trismus nascentium, 8 days old. Magnified 160 diameters.

precipitated during or shortly after delivery, death following in a few hours. These fortunately constitute a very small percentage, and are probably attended by contusion of the medulla oblongata. They are not altogether hopeless, however, for sometimes death may be averted with proper manipulation, and, if necessary, tracheotomy. When the disease occurs later, and the patient is seen on the eve or shortly after the first convulsion, in other words, during the stage of congestion, progress can be arrested, as is amply shown in Dr. McLaughlin's case.

It is not always necessary to the development of the disease that displacement should be marked or visible. In either case, from continued decubitus, unpleasant symptoms may arise, which subside when the child is taken up—the pressure being thereby relieved—only, however, to recur when the infant is again laid down.

The fact that the post-mortem appearances are not uniform was advanced by Dr. Baldwin as irreconcilable with Dr. Sims's views of the pathology of the disease. As has been already shown, this is accounted for by the many who die of asphyxia, from severity of the paroxysms, and consequent congestion of the lungs, before there is time for extrava-

sation. The post-mortem appearances, therefore, and the duration of the disease and its symptoms, really depend upon the degree of pressure, from the slightest to the greatest possible, modified or intensified by its intermittent or persistent nature.

Another class remains to be mentioned, in which *position* alone cannot rectify the displacement. This either depends upon too great ossification and consequent impaction, or the apex of the occiput is dislocated or curved inwards. Here a surgical operation becomes necessary. Cases XXVI. and XXXI. are examples. Such cases would require the most diligent manipulation and attention to afford a chance of success; indeed, I do not know that any contrivance could be devised to retain the incurved apex *in situ*. Dr. Sims reports a case where he punched the scalp with a shoemaker's awl, and with the edge of the parietal as a fulcrum endeavoured to pry out the bone, but he did not succeed. He then followed the plan of Dr. Harrison, and cut down on each side of the lambdoidal suture; and with the flat end of a probe on one side and a director on the other he pushed out the edges of the occiput. The effect was satisfactory, all the urgent symptoms becoming modified, but they would instantly return by letting the bone fall back. Although permanent good was impracticable, the result showed clearly that the symptoms were dependent upon mechanical pressure. The only case of this kind that I saw before death was through the kindness of Dr. Smith Townshend, health officer; the patient was moribund. After cutting through the lambdoidal suture I pried the bone out; a marked mitigation of symptoms immediately followed. There were no means to hold it in position, but the child lived till the next day. At the examination of the head no effusion was found to have followed the operation, and it was with difficulty the opening in the commissure could be found.

The operation that Dr. Harrison successfully performed was for depression and impaction of one side. Dr. Hart performed a similar operation, and forced the occipital bone back to its place. The child had one convulsion and recovered; it was kept reposing on either side. In such cases I believe there is every assurance of success when performed upon early; but where the incurved apex cannot be rectified, the child is then born but to die, the symptoms being generally manifest soon after birth.

Drs. Wilhite and Bryson compared the effect of a spicula in the adult to the pressure of the occiput in the infant. Now, while the results are the same by relieving such pressure, it will be apparent that the effects on the infant are more profound, for instead of local irritation we have contusion at the *fons et origo*, or base of the brain. That such effects are not confined to the human race, is shown from the following striking comparison by Dr. Bryson. "Those who are hunters have noticed, doubtless, in killing a wounded bird by pressure of the thumb upon the

base of the brain, the cry of alarm, the spasm and rigid contraction of the muscles; and if the pressure have not been exerted to a fatal extent, and the thumb be removed, how the rolling of the eyes ceases, the rigidity departs, and the bird seems as well as ever."

The custom of "bouncing" on the arms or lap, for the supposed purpose of quieting the baby, is another evil. Precaution against the disease ought to be observed from birth, by proper instructions to the mother and attendants, and especial care should be taken that the child has a soft feather pillow to lay its head upon when asleep, during nursing, or when carried in the arms or lap. Such article should constitute one of the indispensables of the baby's toilet. This is probably the principal reason there are not more victims of trismus among the better class of people, among whom infants are not allowed to lie upon the back in a narrow crib long enough for injurious effects; among whom, too, they have the attention of well-paid nurses, and the benefit of frequent change of position from the lavish manner in which they are fondled.

The fronto-parietal position, or face looking toward the horizon, is the proper one generally for either occipital depression or overlapping of one side. In all conditions the disease results from a pressure expended at precisely the same point. The less direct and less powerful, as shown, accounts for the chronic form or trismoid.

One more interesting point in this subject is the cause of still-born children, where the cord is not at fault, and when movement has been distinct just before and during a tedious labour. Death cannot occur from asphyxia, because respiration has not set in. What, then, will cause it but prolonged pressure on the brain? In a still-born infant that I saw recently, the incurved thumbs and toes, and general stiffness, attracting my attention, examination showed intense congestion and dotted extravasation of the spine, and posterior part, and base of brain. M. Theln (*Journ. de Chir.*, June, 1844) relates a similar case of a child born dead in a state of tetanic rigidity, but there was no autopsy.

Now, taking into account the mortality in Washington, New Orleans, and other cities, and their proportion of population, it is no exaggeration to say that the whole number who in the United States annually succumb to this disease is 25,000, which, when compared with the population of the globe, and the greater prevalence of the malady, chiefly from ignorance, in the eastern countries, is appalling to contemplate; for it gives a death-rate of more than half a million.

It would be ungrateful before closing this article not to express my acknowledgments again to Dr. D. C. Patterson, Coroner of the District, for his co-operation in prosecuting these investigations. To Dr. Smith Townshend, Health Officer, for much kindness and many favours. To Surgeon A. A. Hoehling, U. S. Navy, and Dr. D. S. Lamb, for translations. To Col. John S. Billings, Surgeon U. S. Army, Librarian of the Surgeon-

General's Office, I am especially indebted for facilities in consulting the unsurpassed collection under his charge.

Thus I place this subject before the profession, earnestly invoking for it the careful consideration its importance demands. To myself it has been an exceedingly interesting study. I have not formed conjectures, and then moulded facts to suit them; but have honestly sought—not without personal sacrifice, and sometimes even personal danger—to accumulate trustworthy information. The whole matter is humbly submitted, believing, as the now lamented Dr. Sims has aptly said, "If I am wrong, cotemporaneous observers will prove it. If I am right, future generations will feel it."

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## ARTICLE V.

### CLINICAL HISTORY OF A CASE OF RECURRENT DROPSY OF THE LEFT MIDDLE EAR, COMPLICATED, AFTER EIGHT YEARS' DURATION, BY AN ACUTE ATTACK OF MONOCULAR OPTIC NEURITIS (CHOKED-DISK[1]) ON THE SAME SIDE, FOLLOWED BY GENERAL TABETIC SYMPTOMS: WITH REMARKS.

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WE have been induced to publish this yet unfinished case, not only on account of its great rarity, but also to make attempts to give answers to the curious and almost anomalous chain of interesting symptoms which have presented themselves from time to time during its study. We are fully aware that all we can say is purely hypothetical, and that the true response to our questionings can be obtained only by actual post-mortem examination; but by the process of exclusion, through careful and repeated clinical research, we think we have arrived at certain data which make the clinical features of sufficient importance to study until that time when nature shall furnish us with an absolute answer.

### HISTORY OF AURAL SYMPTOMS.

BY DR. BURNETT.

*July* 8, 1874. Jacob R. Yeager, aged fifty-five years, a furnace-maker, single, of a lean and rather sallow appearance, makes the following statement: "At the age of eight years operated upon at the Pennsylvania Hospital by Dr. McClellan for a polypus in his right ear. After considerable cutting and cauterizing, the polypus disappeared. Since that time there has never been any hearing in the right ear."

[1] I use the term "choked-disk" to signify a choking of the intra-ocular tip of the optic nerve by serous extravasation into its subvaginal space. (Dr. Oliver.)

Inspection of this ear reveals a very shallow external auditory canal not more than two-thirds of the normal depth, at the bottom of which is no sign of a membrana tympani, but simply movable integument over bone. A paracentesis knife or a needle run through the fundus of the auditory canal until it strikes bone causes no pain. The integument in the place of the drum-membrane moves under the pneumatic speculum of Sigle. There are no traces of any ossicles of hearing. The tuning-fork, vibrating on the vertex, is heard better in the right ear than in the left, and the patient feels air enter the right tympanum, when he inflates the Eustachian tube, by Valsalva's method. It seems probable that the old cauterization in this auditory canal for the cure of a polypus stimulated excessive granulations, which, becoming organized, were allowed to close up the auditory canal and obliterate this ear. It may also be inferred that in this man there is a tendency to aural disease, probably of a catarrhal nature. His health is good; he is a strong man, and has been a hard worker in his trade all his life. The patient applies now, however, for relief from hardness of hearing in his good ear, the left. The membrana tympani on this side is opaque, lustreless, white, and flat, although the malleus is retracted.

Hearing for the watch $\frac{4 \text{ in.}}{60 \text{ ft.}}$. Politzer's inflator makes no impression on the ear, but the catheter increases the hearing to $\frac{15 \text{ in.}}{60 \text{ ft.}}$. This, however, is not a permanent relief, as the patient states on July 20. He has been catheterized before by another surgeon, but with the same result, viz., improvement for a few days; then recession of hearing.

31*st*. The improvement gained by the catheter at last visit, four days previous, remains. Hearing for large watch, on left side, $\frac{15 \text{ in.}}{60 \text{ ft.}}$.

*August* 3. The hearing at this visit $\frac{4 \text{ in.}}{60 \text{ ft.}}$ for the watch. Immediately after catheterizing $\frac{3 \text{ ft.}}{60 \text{ ft.}}$ for the watch.

*Sept.* 12. Patient complains that there is a "drop of movable fluid" in his left ear. In a reclining position, the hearing becomes suddenly better (two feet for the watch), but when the head is in an upright posture the hearing sinks again (two inches for the watch). This was verified by me, by testing with a watch. Though no bubbles could be detected through the membrana tympani, paracentesis was performed in the lower posterior quadrant, and there escaped a brownish-yellow, transparent fluid when the patient inflated by Valsalva's method. No pain from the operation. Hearing now rose to $\frac{15 \text{ ft.}}{60 \text{ ft.}}$ for the watch; a better hearing than the patient has had for many months.

14*th*. The patient says that the sensation of the fluid "drop" in his ear has not returned, and in his opinion his hearing is normal.

*Jan.* 1, 1875. Patient calls to say that his hearing has continued to be good.

*March* 14. The patient now called to say that he felt the "old drop of fluid" in his ear, and he wished me to perform the paracentesis again. The hearing had sunk again to a few inches for the watch, and the drum-membrane looked flat and white, as it had done before the first paracentesis.

Paracentesis was now performed for a *second* time at the same point in the drum-membrane. Upon Valsalva's inflation, the same yellowish-brown fluid escaped from the opening and ran out at the meatus in quantity, ten to twelve drops. This gave the same relief to the hearing as the first operation. After the incision into the membrane, the latter assumed a bluish tint, and was thrown into delicate radiate rugæ.

23*d*. The incised spot healed quickly in a few hours on the 14th instant, as he ceased to be able to blow air through it by Valsalva's operation; and to-day his ear feels dull, and he desires the membrana tympani incised again. The membrane looks flat and pale. Paracentesis being again performed makes the *third* operation; there escaped the same kind of fluid from the drum-cavity. This gave the usual relief to hearing. The nares and fauces gave evidence at this time of some catarrh. Patient has cold in his head. He is told to come back as soon as his ear begins to fill up again.

*April* 15. The ear again feeling closed up, the patient presents himself for another operation. Paracentesis for the *fourth* time is performed in the same spot of the drum-membrane, and there escapes the same transparent fluid, perhaps a little deeper in colour this time, with the same relief to hearing.

*May* 8. Patient states that his ear is again deaf. He cannot relieve it by self-inflation; nor has he ever been able to do it. A *fifth* paracentesis is performed with the same results as heretofore.

19*th*. The ear continues free from deafness, but as patient thinks he can feel some fluid accumulating, the *sixth* paracentesis is performed, but no fluid escapes. The membrana tympani heals in a few hours.

*Sept*. 7. The patient complains again of the same filling of his ear, paracentesis is performed for the *seventh* time, with the same escape of fluid as at previous operations.

*Oct*. 26. Again the same old aural symptoms necessitate the paracentesis for the *eighth* time, with the same results.

*Nov*. 24. A similar noting of symptoms in case-book, with a note of the *ninth* paracentesis.

*Jan*. 3, 1876. Again the aural symptoms, a *tenth* paracentesis, and the usual flow of transparent, yellow-brown fluid, and the return of hearing. There are no signs of naso-pharyngeal catarrh.[1]

*Feb*. 19. Patient comes again with his ear "stopped up." He is in good health, and hopes to serve in the police force on Centennial Exhibition grounds. The membrana tympani preserves the same rather negative appearances, *i. e.*, not indicating presence of fluid behind it. Yet guided by a knowledge of its appearance on previous occasions when fluid was behind it, and also by the patient's feeling, paracentesis for the *eleventh* time is performed. A quantity smaller than usual of the same kind of pale, tea-coloured fluid escapes through the puncture in the drum-head by Valsalva's inflation, with perhaps less relief to the patient's sensations of the presence of fluid. This operation gave relief until March 28. On this occasion the membrana tympani showed a brownish-purple colour. The hearing had become dull, and the ear felt "stopped up." No form of inflation relieved the symptoms. A *twelfth* perforation of the membrana tympani, at the same place, the lower posterior quadrant, gave vent

[1] To this point I have described the case on pages 429–432 in my Treatise on the Ear, 1877, Philadelphia, 8vo. pp. 615.

to the usual kind of fluid, and effected a return of hearing. After the perforation and inflation, the membrane became more of a normal bluish-pearl colour.

*April* 8. There is a reaccumulation of fluid in the tympanic cavity. The patient feels at this time the movable drop of fluid in his ear. The *thirteenth* paracentesis is performed, followed by the escape of the same kind of fluid, and the usual relief to his hardness of hearing.

24*th*. A similar condition of the ear, the *fourteenth* paracentesis, and relief of symptoms.

*May* 17. A similar note, with a *fifteenth* paracentesis, and the same discharge and relief.

*June* 20. The same note, with a *sixteenth* operation.

*Aug.* 23. Similar note, with a *seventeenth* paracentesis. It should be stated that the patient is obliged to be out at night, and in all weathers as policeman at the centennial grounds.

*Oct.* 23. Same notes, with the *eighteenth* paracentesis, in the same spot; lower posterior quadrant of the drum-head.

*Dec.* 27. A similar note, and the *nineteenth* paracentesis.

*Feb.* 6, 1877. A similar note, and the *twentieth* paracentesis. There are no pharyngeal or nasal symptoms to account for the reaccumulation.

*March* 27. The same condition of the ear, and the *twenty-first* operation for relief is performed.

*May* 11. A similar note, and the *twenty-second* paracentesis is performed.

The patient was not seen for a long interval, not until January 25, 1878. He states that for four months past, his ear has been growing duller or "filling up," as he says, and that the sensation of distension has at last become painful. The membrani tympana reveals symptoms in no way different from those usually seen when the patient has presented himself for operation. The hearing is very much reduced; the voice being heard only a foot. I performed paracentesis, the *twenty-third* time, at the lower posterior quadrant, the same kind of brownish, tea-coloured transparent fluid escapes from the perforation thus made, and the relief to hearing is as great as ever—the voice being immediately heard normally. This shows that no organic change can have taken place in the conducting apparatus of the middle ear, though the origin of the fluid in the drum-cavity, remains yet obscure.

*Feb.* 25. The usual "filling up" has occurred again, and a paracentesis, the *twenty-fourth*, gives the usual results of discharge and relief.

*July* 26. A similar note, and the *twenty-fifth* operation, with relief.

*Nov.* 29. A similar condition of ear, and a *twenty-sixth* paracentesis, with the usual results.

*June* 5, 1879. An interval of six months elapses. The patient comes again with the ear "filled up." The *twenty-seventh* paracentesis is performed with the usual favourable results.

*Sept.* 26. Upon this occasion, bubbles were distinctly seen behind the lower half of the membrana tympani. These moved when the patient inflated by Valsalva's method, but his hearing was in no way relieved by the inflation. At this visit, the *twenty-eighth* paracentesis is performed; not so much fluid as usual escapes, but the hearing returns.

*June* 15, 1880. A similar note, the *twenty-ninth* operation, and the same results.

*Sept.* 3. A similar note, with the *thirtieth* paracentesis.

None of the operations have ever been more than simple punctures in the membrane, and have never given any pain.

*5th*, 1881. Only one recurrence of the symptoms, and only one paracentesis in this year. This made the *thirty-first* operation.

*Nov.* 6, 1882. The patient states at this time that his left eye has become dimmed in vision, and that his left ear is again stopped up. Paracentesis, the *thirty-second* in the lower hinder quadrant, failed to give relief, because, as I found out later, the fluid required for an exit a perforation in the upper posterior quadrant. Why, I am unable to say (see note of March 27, 1883). Upon this occasion, I sent him to Dr. Charles A. Oliver for ophthalmic examination, whose notes may be consulted for the results he obtained.

*Dec.* 14. The hearing is found to-day to be three feet for isolated words. The ear feels stopped up, but the membrana tympani looks smooth and fairly normal in colour. The *thirty-third* paracentesis is made, a rather opaque, yellowish fluid escapes, and the hearing thereafter is six feet for same tests as above named. The membrana tympani became very much retracted and thrown into rugæ, and bluish-white in colour, as on March 14, 1875.

*Jan.* 21, 1883. Patient again feels his ear stopped up. Is rather feeble this winter. The *thirty-fourth* paracentesis is made, and a slightly opaque, yellowish, thin fluid escapes, after which the hearing becomes relatively normal.

*30th.* A similar condition of ear again noted. The *thirty-fifth* paracentesis is performed, and a thin yellowish fluid escapes. The hearing is made better thereby, but it does not seem now to reach the same high point after the operations as some years ago. The paracentesis leaves no scar on the membrane. The latter heals in a few hours.

*March* 27. Patient complains that his ear is again "filled up." No bubbles seen behind membrane before paracentesis. The *thirty-sixth* operation is then performed. The membrane seems tougher than usual. Valsalva's inflation forces out a little frothy, brownish fluid, like the usual kind. By this inflation, bubbles are seen moving in the upper and hinder quadrant, but they do not escape through the perforation in the lower posterior quadrant. A second paracentesis was then made in the upper, posterior quadrant, and considerable pale, yellow, thin transparent fluid escaped. Patient says his eye and ear feel better. Hearing for words before the operation, eight inches; after operation, five feet.

In the operation of November 6th, and in that of March 27th, the paracentesis in the lower posterior quadrant did not seem to be adequate for the perfect drainage of the tympanic cavity. Hence in the operation of March 27th, a second puncture was made in upper, posterior quadrant where the bubbles were seen, which could not escape from the first and lower opening, and more fluid escaped from this second upper opening than from the first and lower one.

*May* 1. The patient complained of a stuffed feeling in his ear, and for the *thirty-seventh* time, the membrana tympani was perforated at the lower posterior quarter; but not a drop of fluid escaped, nor could the patient inflate the drum-cavity by Valsalva's method.

*3d.* The patient still complains of the stuffed feeling in his ear, and he says he cannot inflate by Valsalva's method. Paracentesis for the *thirty-eighth* time is performed, and a drop of grayish opaque fluid is forced out by Valsalva's method. The case seems to be changing in type, now

appearing to be more like an ordinary case of hypertrophic catarrh of the drum-cavity.

On *June 6th*, the symptoms of deafness being the same, without any evidence of fluid in the drum-cavity, the catheter was used for inflating the left Eustachian tube, since the patient was unable to inflate as he once could by Valsalva's method; but this gave no relief to his deafness or the sensation of fulness in the ear. The patient is evidently weaker; is dizzy when he stoops, and when he walks. The scar made by the perforation of May 3d is still very plainly visible, demonstrating the want of the quick reparative power always heretofore seen in this case.

*Aug.* 10. The hearing for voice is six inches, only in the left ear. Inflation by Politzer's method increases the hearing to several feet. The tuning-fork vibrating on the vertex is heard best in the right ear, and the voice in the right ear, when words are uttered close to it.

20*th*. The patient can again easily inflate his ears by Valsalva's method. His hearing is nearly relatively normal, *i. e.*, three or four feet for vocal sounds, and he has no further sensations of filling up of his ear with fluid, the occurrence of which he has learned to recognize. He is just as dizzy as ever, especially when he turns around suddenly. The direction of the turning makes no difference; he may stagger toward either side. Scar of last paracentesis still plainly visible, as a red, scab-like line on the manubrium, near the short process, where it has moved from the lower posterior quadrant of the drum-membrane. The membrana tympani moves easily and plainly under Valsalva's inflation.

*Remarks.*—There seems to have been a tendency to aural disease in this man, evinced in his childhood, as may be learned by reference to the notes, in which is recorded an account of the existence of a polypus and an operation for its removal, at the age of eight years. This operation obliterated the parts of the organ of hearing usually visible through the speculum, and has left nothing to compare with the other ear. Hence, all information thus ordinarily derivable by comparison of two ears is lost.

The nature of the disease in the left ear seems to be catarrhal, for, when exposed to influences of air and living, likely to provoke catarrhal symptoms, as in 1876, he was markedly worse, and was obliged to resort to frequent operations of paracentesis for relief. And earlier, at the time of the third paracentesis, he had a severe cold in his head. Then, too, his avocation, that of a furnace or stove-builder, would expose him to influences of heat and cold, likely to provoke a catarrh, and especially an aural catarrh. The frequent restorations of hearing by the operations and escape of fluid are worthy of note. They indicate that the disease lay chiefly in the mucous membrane of the tympanic cavity, and not in the underlying fibrous tissue of the ossicles. Gradually, as the fluid formed more slowly, and in less quantity, and as its escape gave less relief to deafness, it would seem that the mucous membrane had become thicker and drier, and that the case assumed the type of hypertrophic aural catarrh. Other coincidences in favour of the purely catarrhal nature of the ear-disease are that after a paracentesis on May 1, 1883, no fluid escaped from the tympanic cavity, though the ear felt stopped, auto-inflation of the Eustachian tube was im-

possible, and there was no relief to the hardness of hearing. These symptoms of a dry catarrh continued for a month, when the use of the catheter relieved the deafness and other catarrhal symptoms in the ear, but the vertiginous symptoms and the alteration in gait increased. I would say, here, that the only record of a case resembling this in the frequent reaccumulation of fluid in the drum-cavity after repeated paracentesis, is that given by Dr. J. Oscroft Tansley,[1] and called by him Hydro-tympanum.

It is worthy of note that the patient's sensations first drew attention to the fact that movable fluid was in his tympanic cavity. Bubbles were rarely seen in the course of eight years, and not at all until many operations had been performed on the membrana tympani. Before a paracentesis, when fluid was in the tympanic cavity, the membrane of the drum looked lighter in colour, flatter and smoother than after the paracentesis. It then assumed a darker hue, and appeared sometimes thrown into rugæ. If the fluid were allowed to remain some time after it had accumulated, it gave rise to a sense of distension and pain in the ear. After such long retentions, rugæ were most likely to appear. The paracenteses never made a permanent scar on the membrane until the thirty-seventh or thirty-eighth operation. Then, with an apparent change in type in the ear-disease, the reparative power of the membrane seemed impaired to an extent which seemed to make the disappearance of the scar slow; but the drum closed as quickly as ever.

The colour of the fluid which escaped from the drum-cavity after the various paracenteses resembled that seen by me in other cases of undoubted closure of the Eustachian tube, in which Valsalva's form of auto-inflation was impossible. As in this case, Valsalva's inflation was usually very easily performed, and as there was every evidence that the fluid in the drum-cavity never escaped by the Eustachian tube into the fauces, the thought naturally suggests itself that in this man's Eustachian tube there must have been a valve-like fold of mucous membrane or a small gland or follicle, extending across the calibre of the tube, and acting like a valve, opening only towards the tympanum, thus permitting *air* to enter the cavity, but preventing the escape of fluid from it in an opposite direction towards the fauces.

The tuning-fork vibrating on the vertex was heard best in the right ear, because, as has been shown, it was more obstructed than the left ear, in its external auditory canal and tympanum, by organized granulation-tissue. This phenomenon, therefore, cannot be adduced in proof that the disease in the left ear is central in origin. In fact, the gradual improvement of late, and the now relatively normal condition in all respects of the left ear, in a subject presenting an increase in vertigo and alterations in gait, tend to dissociate the aural from the latter symptoms. The latter, rather than being ascribable to ear-disease, seem to be tabetic in origin.

[1] Archives of Clinical Surgery, 1878, p. 63.

## OPHTHALMIC AND TABETIC SYMPTOMS.

BY DR. OLIVER.

On the 6th of November, 1882, I received a note from Dr. Charles H. Burnett, asking me to examine Mr. Yeager's eyes. The patient, a very intelligent man, gave me the following history: He had been wearing glasses for near-work for ten or fifteen years; had had several changes; last pair for four years, never having had any trouble with them. Never any ocular pain or headache. Three days previous, he accidentally discovered that he was unable to see with his left eye: sure that he never had any trouble with this eye before; in fact, he always considered it as good and as useful as the other. Upon examination, I found the conjunctival mucous membranes pallid. Commencing arcus senilis. An irregular, almost central, superficial nebula in the left cornea. Slight shallowing of the anterior chamber of the same eye. Irides light-blue, and freely mobile. Both pupils normal in size and shape. Tn. O. D. V. $=\frac{6}{\text{XXIV}}$. With S. 1 D. V. $=\frac{6}{\text{VI}}$. With S. 3 D. read Sn. 0.5 D. from thirty-five centimetres to fifty-six centimetres. O. S. Light[1] perception in all parts of the visual field; vision dazzling, and reminded him of innumerable yellowish points on a blue ground. No obtainable accommodation.

Ophthalmoscopic examinations showed in right eye: Media clear. Disk irregularly round, about seven diameters in apparent size. Exceedingly dirty red-gray in tint—not excavated or prominent. Scleral ring visible both in and out, although probably continuous around the entire disk, being hidden at the superior and inferior edges by coarse retinal striation. Trace of conus to the nasal side of the disk beyond the scleral ring; whilst to the lower temporal margin of the disk there was a long black pigment massing. Retinal arteries and veins normal in proportionate size, calibre, and colour. No visible splotches or hemorrhages. H. between 1 and 2 D. The ophthalmoscopic examination of the left eye, made by the aid of an instillation of the one-fortieth of a grain of hydrobromate of homatropine, causing even an almost full pupillary dilatation, revealed a far different picture. Region of disk exceedingly swollen, the summit being about 2 D. in advance of the normal portion of the retinal plane, which was equivalent to about 1 to 2 D. The sides of the swelling gradually and evenly sloped in all directions to the irregularly swollen retina; its general outline vertical oval, about eight by ten diameters in size, and its colour almost identical with that of the other eye. The edges of the disk nowhere visible; their position being judged by the situation of the retinal vessels and swollen tissue. Entrance of vessels invisible, being concealed in the substance of the swelling. The principal upper and lower venous trunks enlarged and tortuous, dipping into the swollen retina; several tissues losing themselves by short, deep curves, before regaining their normal calibre and proper course, about twelve to fifteen millimetres beyond the summit of the swelling, where the retina assumed its proper level. Arteries first seen at the base of the swelling as very contracted, tortuous, blood-bearing streaks accompanied in many instances by opaci-

[1] Diffuse reflected sunlight of sufficient power to give $\frac{6}{\text{IV}}$ vision for form.

ties of their lymph-sheaths. Numerous feathery masses of fresh hemorrhagic extravasation in the fibre layer of the retina, especially following the vascular distribution. In the primary bifurcation of the upper temporal division of the central retinal vein, there was a long flame-shaped hemorrhage. Immediately in the macular region could be seen a large irregular hemorrhagic mass, seemingly completely surrounding the fovea, but yet the annular yellowish reflex of the rim of the macula could still be vaguely seen. No visible choroidal changes. Media clear, with the exception of the cornea.

Upon further questioning him, I found that for the past year he had been making a great deal of water, especially at night. By indirect questions, no history of syphilis could be gotten: the patient did not present any external evidences of it. Never had been seriously sick, or suffered any injury. Never used tobacco, or stimulants of any kind. Family history good.

*Central colour-perception taken at a distance of five metres.*[1]

| | O. D. | O. S. |
|---|---|---|
| Red | first seen at four millimetres exposure. | Unable to see anything but candle-light; appearing as a dull diffuse, sometimes brilliant yellowish body. |
| Green | Seen as blue at ten mm.<br>Green at twenty mm. | |
| Violet | Reddish at twelve mm.<br>Pink at twenty-eight mm.<br>Violet at forty-nine mm. | |
| Blue | Seen as green at fifteen mm.<br>Blue at thirty-two mm. | |

Thus approximately giving in the right eye a central colour-sense power, at five metres distance, of one-half vision each for red, green, and violet; and one-fourth for blue.[2]

The amount of colour-vision in the left eye could not be obtained, as it was reduced to a mere sensation of yellowish light.

Fields of vision were now accurately taken:[3] That of the right eye for form, white, blue and red were found slightly but equally contracted in the order given. No indentations (except that caused by the patient's prominent nasal bridge) or interruptions found, although carefully looked for. In the left eye, with candle-light fixation, light perception obtained by the motion of a second candle-light, was equal in all meridians except to the extreme temporal and nasal sides in the horizontal meridian, where, in sectors each of about thirty degrees, the movable light faded and became nearly lost. No scotomata. With his right eye, he matched Holmgren's skeins of worsted correctly, but slow in determination: With his left eye, the different colours appeared as mere shadings and gradings of "dirty-grays."

[1] For description of instrument used, see Archives of Ophth., vol. x. No. 4, December, 1881.

[2] See method of experiments by the writer for the determination of a normal standard of colour-sense in the Archives of Ophthalmology, vol. xi. No. 1, March, 1882.

[3] One centimetre square each of unglazed white, blue, and red paper pasted on slips of dead-black cardboard, were carried inwards towards the fixation point, situated thirty centimetres' distance from the eye.

I had him return, on the following day, with a specimen of his early morning's urine. This I found to be amber-coloured, transparent, with no sediment; specific gravity 1018; acid reaction; no albumen or sugar. Microscopically; no tube-casts of any description, although several slides were successively ploughed over and over, merely showing a few oxalate of lime crystals. I then ordered for him two pairs of convex spherical lenses. 1 D. for distance, and 3 D. for near work. No general treatment. To report at stated intervals, so that I might watch and study the passing symptoms.

*Dec.* 14. Returned, saying that the sight of his left eye had been gradually increasing for the past two weeks, but curiously, he noticed at the same time, that his left ear began to feel full, and hearing had been proportionately deteriorating. His expression, "the water has left my eye, and gone back to my ear," was very emphatic. It had become so bad that he had visited Dr. Burnett early in the morning, and had had paracentesis of the left tympanic membrane performed, evacuating a quantity of fluid.[1] The appearance of the blue field studded with brilliant points also ceased about two weeks ago. Had had a great deal of dizziness. Vision and accommodation of the right eye the same. O. S. V.= $\frac{6}{LX}$ (centric): With S. 1 D. V.= $\frac{6}{XXX}$ (centric): With S. 3 D., Sn. 0.50 not read, but clearest from forty-five centimetres to fifty centimetres.

Urine re-examined; amber colour and transparent. Sp. gr. 1017. Chemically: Acid reaction; no albumen or sugar. Microscopically: A few oxalate of lime crystals; no animal debris with the exception of a few epithelial scales.

Thirty minutes after tapping of left drum-head, ophthalmoscope showed (without the use of a mydriatic) that the nerve of the right eye had still the same dirty red-gray appearance. In the left eye (pupil partially dilated by homatropine), the edges of the disk were everywhere visible; showing a well-marked scleral ring all around. Disk itself irregularly oval, seven by eight diameters, long axis about one hundred degrees. Exceedingly dirty red-gray in appearance and on the same general level as the fundus; although a few of its most prominent vessels were one-half dioptric in advance. Choroidal ring to the nasal side. Retinal arteries diminished in calibre. About two disks' diameter below the disk there were some small irregular blood masses in the fibre-layers of the retina, in close proximity to the lower retinal vein. The large irregular flame-shaped hemorrhage situated in the primary bifurcation of the upper temporal vein was still *in situ*, although less plainly marked, as it was undergoing absorption, especially at its edges. On the upper side of the lower outer branch of the lower temporal artery, there was a small absorbing hemorrhage. Macular region occupied by a grouping of irregular yellowish-brown bodies, each about the size of a pin's head, looking like partially absorbed hemorrhages undergoing fatty degeneration. Fovea still dimly seen. About a disk's diameter to the temporal side of the macular region, there were two large irregular hemorrhagic extravasations (not fresh) each about one-sixth the size of the disk; whilst about a disk's diameter beneath these, there were several small absorbing masses.

[1] See note in Aural Report.

*Central colour-perception (with S. 1 D.) at five metres.*

| | O. S.[1] | O. D. |
|---|---|---|
| Red | Very dark spot of fire at twelve mm. exposure.<br>Pink tinge at thirty-seven mm.<br>Pink at forty-eight mm.<br>Deep pink, sixty-seven to ninety mm. | Red first seen at five mm. exposure. |
| Green | Spark of fire at six mm.<br>Sky-blue, sixty to ninety mm. | Light-blue at sixteen mm.<br>Green at fifty-three mm. |
| Violet | Dark spot of fire at twenty-one mm.<br>Dark pink with a yellowish cast[2] at ninety mm. | Reddish at six mm.<br>Violet at twenty-three mm. |
| Blue | Blue spark of fire at twelve mm.<br>Blue cast at fifty-five mm.<br>Dark-blue, eighty-four to ninety mm. | Green at eleven mm.<br>Dark green at eighteen mm.<br>Blue at twenty-nine mm. |

Both "patellar-tendon" reflexes exaggerated; but more markedly so on left side. The kick was readily produced by gentle percussion on the belly of the muscle.[3]

*Dec.* 15. Visual fields of right eye taken, and found to be about the same as at last examination.

18*th*. Physical exploration gave absence of any pulmonary, cardiac, or hepatic trouble. Radial pulses, eighty-four. Ophthalmoscope showed same condition of left optic nerve and retina as at last visit. Macular region of right eye intact.

Visual fields of the left eye were now obtainable, and, being carefully taken, gave some interesting results: One centimetre square of white, first seen in all directions from sixteen to twenty degrees from fixation point. Same size blue seen at fixation point, and extending out as a good blue about five to eight degrees in all meridians, and then becoming lighter and lighter until lost at about twelve to sixteen degrees. One centimetre square of yellow, first seen as yellow in all directions from fixation point, for from six to eight degrees: Whilst red (invariably called light pink), seen only from two and a half to five degrees in all directions from fixation. The general outline of all these fields being vertical ellipses, the macular fixation being situated at the bisection of the two principal foci. No scotomata or interruptions.

*Jan.* 2, 1883. O.S. S. 1 D. V. $= \frac{6}{\text{XXIV}}$. Patient asserted that for the past week his left ear had been getting deaf. Thinking that some light might be thrown upon the case, I determined to examine the condition and power of the optic nerve immediately before and after paracentesis; but no observable changes could be seen, or any loss or gain in vision for form or colour could be made out. I found the edges of the left disk every-

[1] Tried diseased eye first, telling patient I had a new card of colour, thus endeavouring through want of previous knowledge to obtain more accurate results.

[2] See Archives of Ophthalmology, vol. xi. p. 69.

[3] The belly-tap kick, I think, is a fair indication of exaggeration of the reflex.

where visible, and the retinal hemorrhages undergoing absorption; the flame-shaped one presenting a granular appearance. The macular extravasation was still to be seen, but not so marked as at last examination.

*16th.* O. S. V. $= \frac{6}{LX}$: S. 1 D. V. $= \frac{6}{XXIV}$? : S. 3 D. Sn. 1.25 clearest (not read) at about thirty-seven centimetres. Ophthalmoscope showed the disk's edges everywhere visible. Retinal hemorrhages fast absorbing. Disk presenting a "filled-in" appearance.

*30th.* O. D. vision and accommodation the same. O. S. S. 1 D. V. $= \frac{6}{XIX}$: S. 3 D. Sn. 1.25 clearest (not read) at about thirty-seven centimetres (before and after tapping). Ophthalmoscope showed both of the nerves in the same condition as at last visit (before and after tapping). Complained of two attacks of twitching of the facial muscle of the left side, each lasting for four or five minutes.

*Feb.* 13. Vision of left eye with S. 1 D. $= \frac{6}{XV}$. Able to spell words of Sn. 125 with S. 3 D. at fifteen centimetres.

*27th.* O. S. eye-ground much clearer; no new changes. The extravasations fast disappearing. At this time, form-vision of left eye reached $\frac{6}{XII}$? Accommodation about the same as at last visit.

*March* 13. Vision of left eye again failing; S. 1 D. V. $= \frac{6}{XIX}$. Accommodation about the same. Eye-grounds still appear the same. R. Collyr. acidi boracici gr. xvj ad f℥j, for slight attack of catarrhal conjunctivitis.

*27th.* O. S. S. 1 D. V. $= \frac{6}{XIX}$: With S. 3 D. Sn. 0.50 clearest (not read) from twenty-eight centimetres to forty-eight centimetres. Eye-grounds the same as at last visit.

*April* 10. Vision and nerves of left eye the same. "Patellar-tendon" reflex still increased on left side, but the exaggeration in both contractions not so marked as during previous examination. Opportunity now presented itself by which I was able not only to obtain an accurate record of the exact amount of colour-blindness of the left eye during its post-neuritic stage, that is, its passage into atrophy; but to actually preserve and permanently keep examples of the colour-changes for future comparison, both for myself and all those who are interested in the subject. This I did by means of a Radde's colour-scale.[1] In number one test (green) of Holmgren; with his left eye he matched two wools equivalent to letter r of

[1] Published by the "Société Sténochromique," of Paris. It consists of a long quadrangular piece of muslin upon which are forty-four strips of cardboard pasted side by side. The first strip has the so-called "index" on it—a vertical row of thirty-one "rainbow-colours," commencing with cinnabar and terminating with carmine, followed by eleven more strips, these latter being examples of the principal colours mixed with gray, each colour being numbered. The next strip has the verbal expression of each index-colour situated on a level with the colour itself. Now follow forty-two strips, each having an index-colour about the middle of the strip, from which twenty lettered shades and tones successively rise and fall, so that by the time the end of the table is reached, we will have had over eight hundred and fifty colours, each graded and registered in its proper place.

number five strip, and letter q of number thirty-two strip of the scale. Letter r of number thirty-five of the scale was the exact equivalent of the wool selected as being the nearest match to the rose tint; whist letter q of number twenty was the counterpart of the wool chosen in the number three or control test. I tested still further for confirmation, and found that the letter i of number twenty was the colour of the wool chosen as nearest to pure blue (letter i of nineteen). Yellow vision was good.[1] No evidence of any colour-blindness found in the right eye, even after repeated examination.[2]

*May* 1. Vision of both eyes same as at last visit. Ophthalmoscope showed that the left nerve was becoming grayer. Retinal arteries and veins as before. Von Graefe's tapping-test[3] gave negative results. No cranial bruit heard. Left "patellar-tendon" reflex was still increased, although reflex diminishing.

15*th*. Complained of a heavy pressure in frontal region, there being no difference in its intensity on either side. Said he had been getting dizzy when he walked, whilst eyes were closed. Left "patellar-tendon" reflex still the greater, but both diminished. O. D. S. 1 D. V.$=\frac{6}{VI}$. O. S. S. 1 D. V.$=\frac{6}{XIX}$. Asserted that taste was perfectly good, but that smell was not. This he had noticed for the past twenty years, dependent, he thought, upon his left nostril not being so free. No subjective sensations of smell. I tested him, and found smell deficient with his left nostril, although canals perfectly free, and mucous membranes identical. Patient able to eject air through his two nostrils with equal force against his hand. Ophthalmoscopic examination of the left eye showed that its disk's edges were everywhere visible. Commencing excavation. Merely few pigment stains where previous hemorrhages existed. No new extravasations. No change in calibre of bloodvessels or colour of current from that of last examination.

31*st*. Such marked changes had occurred in the left eye that I instilled the one-fortieth of a grain of hydrobromate of homatropine for more extended examination. Ophthalmoscope showed that the disk was deeply excavated into the lamina cribrosa, the excavation being large, and shelving almost directly up to scleral ring. Retinal arteries and veins were diminished in calibre, both in proportion to their previous condition, and the coexistent size of the retinal vessels of the other eye, especially the arteries, which were being rapidly reduced to mere threads. Colour of the venous current more nearly normal, with less tapering of vessel walls as they entered the optic nerve. Nerve itself had a comparatively grayer hue, and was less capillary than its fellow. The hemorrhage in the pri-

[1] The use of Radde's scale in this connection was first hinted at by Geissler in "Schmidt's Jahrb.," Bd. 191, s. 92, but, as far as the writer knows, no attempts to methodize its employment have ever been made.

[2] It may be worth while noting that after the writer had selected the proper strip in Radde's scale to place the chosen colour in, the patient himself was made the one to compare the selected wool with the nearest changes, he being more able, by reason of his acquired power of differentiating shades, to give the exact intensity, and hence the proper letter.

[3] Sharply tapping the cranial vault with the finger: Von Gräfe asserted that the position of a cerebral tumour may sometimes be ascertained by this method; the tap causing acute pain at the point of the morbid growth. "Kl. Monatsbl." 1863, S. 3.

mary bifurcation of the upper temporal vein was entirely absorbed, allowing clear retina to be seen; but the upper macular branch had some pigment degeneration situated near it, in the position of the previous extravasation. All traces of smaller hemorrhages in the inferior portion of the retina had disappeared. The lower edge of the rim of the fovea centralis was still seen as a crescent, but in and above it were some unabsorbed masses, near a small macular twig of the lower temporal vein.

Quinine tasted the same on both halves of the posterior portion of the dorsal surface of the tongue. Ether and iodoform more plainly smelt with right nostril. Egress of expulsed air equally free on both sides. Radial and carotid pulses equal in volume, strength, and rapidity (eighty beats per minute, comparatively full and strong for time of life). O.S. 1 D. V.$=\frac{6}{\text{XIX}}$.

*June* 14. O.D. S. 1 D. V.$=\frac{6}{\text{VI}}$. O.S. S. 1 D. V.$=\frac{6}{\text{XXX}}$. Visual fields again taken. Those of the right eye were somewhat concentrically contracted; the red field being about two-thirds its previous size. Those of the left, although continuing of the same general form, were only about two-thirds their former size. Red still called pink, but curiously only so at the periphery: The patient persisted that the colour became a "dirty-brown" when it had reached fixation point. Amount of colour-blindness obtained by means of the wools and scale gave the following results: With right eye wools sorted and matched correctly. In the green test, with left eye, he matched a skein equivalent to letter n of number twenty-two strip. In the rose test, letter n of number four strip. In the control test, letter q of number twenty-four. For the nearest to blue, he selected a wool corresponding to i of nineteen; whilst with yellow v of number forty-two was the match.

*Central colour-perception at five metres.*

| | O. S. | O. D. |
|---|---|---|
| Red | "Light pink fire" at thirty-two mm. exposure.<br>Darker at fifty-four mm.<br>"Lead colour" at ninety mm. | Red first seen at five mm. exposure. |
| Green | Dark spark of fire at fourteen mm.<br>Brighter at twenty-five mm.<br>Lighter and brighter, forty-eight to ninety. | Green { Blue at six mm.<br>Green at forty-two mm. |
| Violet | Yellow spark of fire at twenty-six mm.<br>Lilac, eighty-four to ninety mm. | Violet { Yellow at six mm.<br>Violet at thirty-six mm. |
| Blue | Dull spot of fire at thirty-two mm.<br>Brighter, fifty-five to ninety mm. | Blue { Green at twelve mm.<br>Blue at forty-two mm. |
| Yellow | Bright blaze of fire at twelve mm.<br>Brighter at twenty-two mm.<br>Brighter with a blue tinge at forty-four mm.<br>Blue tinge gone, very pale lemon colour, at seventy-two to ninety mm. | Yellow first seen as yellow at twenty-five mm. |

28*th*. O.D. S. 1 D. V. $= \frac{6}{\text{VII}}$. S. 3 D. showed a slight increase in presbyopia, "ρ" being removed about three inches. O.S. S. 1 D. V. $= \frac{6}{\text{XXX}}$??. Left "patellar-tendon" reflex still the more.

*July* 12. Vision remained the same. Said that he had not had any twitching of the muscles of the face. Voluntarily told me that he had lately noticed a tendency to stumble sideways whilst walking, and that his left knee gave out upon going up stairs. Tendency to sleep. No headache or neuralgia of any kind. No trouble with water. Bowels regular. "Patellar-tendon" reflex on the left side still the more. I spent some time making comparative æsthesiometric experiments, both with blunt and sharp points, in order to see if tactile sensibility was lowered or changed; but, after the most prolonged examination with careful and conscientious endeavours on the part of both the patient and myself, I could not get any departure from what I supposed ought to be considered normal. Contact in relative positions and directions in many places on the two sides of the head, trunk, and limbs failed to show any unilateral derangement of sensibility.

26*th*. Complained still more of the tendency to stumble sideways, compelling him to throw the other foot to the same side, to keep himself from falling. Asserted that he had "a weight on the top of head," and that he was more disposed to giddiness. No twitching in any muscle. No shooting pains. Said that he continually felt as if he was "walking on something soft," and that he "can't feel tread so much;" although "no difference in the two sides." Gets "tired in walking." Knows "that sight in left eye is failing." Tendency to sleep and drowsiness. Left knee gives way when he attempts to go up and down stairs. Examination showed me that the vision of his eyes remained about the same. Left "patellar-tendon" reflex the more. Incoördination of the lower limbs tested by making him walk in a straight line, without looking at the floor; showing a tendency to throw himself towards the right, when the right foot was being planted, and towards the left when the left foot was being placed on the floor. Said that there was a slight tendency to reel and fall, when I made him attempt to balance the body whilst he was standing erect, with his eyes shut; although to all appearances he stood perfectly still. Muscles of limbs equally developed and well nourished for time of life. Spine not tender to pressure. No history of spontaneous pain in that region. Testing of a few of the superficial reflexes gave me entire absence. Plantar reflexes not tried; cremasteric showed want of testicular contraction; no obtainable contraction, not even stiffening or rigidity of the abdominal, gluteal, and epigastric muscles.

*Aug*. 9. Still had the subjective sensation of "treading on something soft." Dizziness remained; but he really felt better than at last visit. Vision the same. Pupils normal in size and shape. Irides equally responsive, separately or combined, to both light stimulus and the accommodative act. I instilled the one-fortieth of a grain of sulphate of daturia into the left conjunctival sac, so that I might obtain an accurate ophthalmoscopic view. The disk still presented the same dirty red-gray appearance; the grayness being more marked in the deeper layers. Arteries, veins, and excavation same as at last examinations. All traces of splotches and hemorrhages disappeared. Macular region slightly granular and

irregular. Disk of the right eye dirtier and grayer, although by no means so atrophic as its fellow.

20*th*. Bright day. Excellent vision for the right eye; reading on a new card, every letter of six dioptric type at six metres distance. Vision of left eye gotten with the same card, at the same distance, showed a haphazard guess at number forty-eight dioptric type. Action of irides as at last visit. Weight on top of head persisted, and ground still felt soft under his feet. "Patellar-tendon" reflexes less than ever, yet the same relative difference existed. Said that he had ceased all sexual desire some five or six years ago.

27*th*. Vision of right eye the same as at last visit. That of the left had fallen to one-tenth of normal $\left(\frac{6}{LX}\right)$. I sent him to my friend, Dr. G. Betton Massey, to see whether there were any discoverable motor derangements. The following is the report: "Muscles of expression of right side of face deficient in motility. Is unable to squint or grin on that side (the patient dates this from the time of the removal of a polypus from the right ear). The grip of both hands is good: Dynamometer, R. 115, L. 115. Has all motion of arms and legs with no apparent diminution of force. Electrical condition of muscles and motor nerves: Face-response to F. C. equally good on both sides. All other muscles and nerves responded well to faradic current, except peroneal nerves, which showed slight diminution on both sides. Galvanic current; normal reaction.—Ka. S. Z. An. S. z.—present in muscles and nerve, which also showed a normal degree of quantitative action.

Remarks.—The want of motility in conjunction with the presence of a good response to faradism, and no degenerative reaction on the right side of face, would at first glance point to centric trouble, but I think this must be excluded when we take into consideration the patient's assertion of the simultaneous occurrence of the stiffness of the right face with the removal of the polypus. Such traumatic cause for the unilateral palsy would naturally suggest a diminution in the faradic response and other evidences of degenerative reaction. Yet such is by no means necessarily the case. An interference with the electrical reactions only occurs in those cases of peripheral palsy where the traumatic cause is of a nature sufficient to impede the proper conduction of trophic influence. Where traumatism falls short of such a degree, the motility may be diminished without change in electrical reactions.

The slight lessening to F. C. in the perineal nerves is not so easily explained; but the absence of degenerative reaction in this situation undoubtedly excludes a peripheral cause."

29*th*. Again tested colour-blindness. Wools correctly matched with the right eye. In the green test with the left eye, letter t of number seven was the selected equivalent; letter m of number thirty-two was the match in the rose test; letter l of number fourteen was that of the control test; letter u of number forty that of the blue; letter m of number nine that of the yellow.

At this point Dr. Burnett and I agreed to close the case, as we both thought that we had sufficient data to establish a fair and probable solution of the trouble; reserving the later changes for a future paper in which a final report could be embodied with the post-mortem examination, thus showing how much dependence can be placed on the significance of pass-

ing symptoms in the diagnosis of some of the rarer forms of grave and insidious nerve disease.[1]

*Remarks.*—Before going into the discussion of the possibility of any connection between these curious series of phenomena, it will be of value to point out the meaning of a few of the ocular and other changes I have observed during my study of the disease.

*Onset and type of the choking of the disk.*—It will be remembered that it was sudden and that it was purely unilateral. Upon carefully going over the literature of optic neuritis dependent upon intra-cranial change, excluding orbital disease, external injury,[2] true fracture, etc., as a cause, I find comparatively few of the uniocular type. Study[3] of the combined cases reported by Annuske[4] and Reich[5] gives less than seven per cent. of the unilateral form. Gowers, on page 130 of his *Medical Ophthalmoscopy*,[6] says: "The neuritis of tumours is in most cases double, sometimes equally advanced in the two eyes, often more intense and subsiding earlier in one than in the other. Rarely the affection of the disks is unilateral . . ." Further on[7] he gives the clinical history of a case of unilateral optic neuritis, and thinks it was as "in most cases in which it is unilateral, on the side opposite to the cerebral lesion." Von Graefe[8] mentions a case of brain tumour with uniocular choked disk. Dr. J. Hughlings Jackson, in a paper published in the *Royal London Ophth. Hosp. Reports*,[9] gives two cases of uniocular neuritis from cerebral tumour (one

[1] Whilst reading an account of the illness of Mr. John C. Saunders, author of a posthumous volume entitled "A Treatise on Some Practical Points Relating to the Diseases of the Eye," published in London in 1811, I noted the similarity of his symptoms, although of an aggravated and more pronounced type, to those seen in this case. The monocular changes in both form and colour-vision, with subsequent partial restoration of sensibility. The general motor and sensory disturbances; "he did not always distinctly feel the ground," etc. Then the result of the autopsy, where, although the rest of the brain was healthy and firm, "the dura mater adhered firmly to the inner side of the cranium, especially over the right eye; but it was apparently free from disease. The tunica arachnoidea and pia mater were healthy." This is quite interesting; the situation and position of the adherence confined to the right side over the affected eye; the distinction made between the outer tunic being "apparently free from disease," and the inner two described as "healthy;" the consideration of the fact of the imperfect methods and instruments for research in those days, and the low grade of inflammatory change they had to deal with, all lend great weight to the conclusion of a very chronic pachymeningitis complicated by tabetic changes. The finding of freshly extravasated blood with softening of contiguous brain-substance was but the post-mortem evidence of the immediate cause of his death—apoplexy.

[2] Hulke, Royal London Ophthal. Hosp. Reports, vol. vi. pp. 90–93.

[3] Norris, Phila. Med. Times, Aug. 30, 1879, p. 565.

[4] Arch. f. Ophth., Bd. xix. Abth. iii. s. 164.

[5] Klin. Monatsbl. f. Augenh., Bd. xii. (1874), s. 274.

[6] A Manual and Atlas of Medical Ophthalmoscopy. By W. R. Gowers, M.D., 1879, London, 8vo. pp. 352.

[7] Ibid. pp. 272, 273.

[8] Arch. f. Ophth., Bd. xii. Abth. ii. s. 100.

[9] Vol. vii. p. 573, "Observations on Defects of Sight in Diseases of the Nervous System."

having been previously reported by Dr. H. Pagenstecher);[1] Jackson's case being one of left-sided neuritis with left hemiplegia, the autopsy revealing a large tumour in right cerebral hemisphere. Jackson considers the occurrence "very rare," and thinks that the morbid growth is almost always situated on the opposite side from the optic neuritis. This last observation has been partially confirmed by the experiments of Dr. Norris[2] in injecting fluids through the lower lateral corner of the anterior fontanelle of dead-born and older children, in which he usually succeeded "in filling the subvaginal space of the nerve on the opposite side of the head more completely than that on the same side."

Other cases have been either mentioned or reported by Reich,[3] Bouchut,[4] Wells,[5] Jeaffreson,[6] Noyes,[7] and Pooley.[8] Field gives[9] an interesting case of brain-lesion with hemiplegia on the same side and uniocular neuritis on the opposite side. In this instance the left eye was the one affected. Careful reading of the second of "Two Cases of Uniocular Amaurosis," a paper written in 1866, by Jonathan Hutchinson,[10] causes me to think that it was dependent upon a previous neuritis; yet I give it with no certainty, merely worthy of doubt. He cites, in a previous paper[11] contained in volume four of the same journal, the study of a number of amaurotic eyes, in which a few of them, especially cases one, three, and fourteen, may with reason be thought to have been the resultants of consecutive neuritis from nerve-sheath filling. Hulke, in a paper entitled "Cases of Neuritis Optica, Neuro-Retinitis, and Retinitis,"[12] publishes some thirty-nine cases, with remarks; among which several, notably numbers thirteen and fourteen, may be taken as fair examples of the unilateral type of this class. Magnus[13] and Pieuzal[14] are said to have also reported cases.[15]

[1] Roy. Lond. Oph. Hosp. Reports, vol. vii. (1871), p. 130. "A case of glioma in the left hemisphere, whilst left optic nerve intact."

[2] Referred to on page 567 of the Phila. Med. Times, Aug. 30, 1879.

[3] Klin. Monatsbl. f. Augenh., Bd. xii. (1874), s. 274. Zur Statistik der Neuritis Optica bei intracraniellen Tumoren (aus eines Abdh. im militär. Journ. (russisch), Juli, 1874.

[4] Ophthalmoscopie Médicale, 1876, p. 142. Referred to in Noyes' Treatise.

[5] A Treatise on the Diseases of the Eye. By J. Soelberg Wells, 1883 (Fourth Amer. ed.), p. 559. No particulars given.

[6] The Lancet, London, March 8, 1879, p 329.

[7] Treatise on Diseases of the Eye, 1881, p. 307. Merely mentioned; no history given.

[8] Archives of Ophth. and Otol., vol. v. p. 148. Tumour on the same side as neuritis.

[9] Brain, vol. iv. (1881), p. 247.

[10] Royal Lond. Ophth. Hosp. Reports, vol. v. p. 185.

[11] Report on cases of amaurosis from intracranial causes, in which one eye only was affected, p. 235. Vide a series of thirteen cases by same author on pages 316, 320, in volume 9 of same reports.

[12] Royal Lond. Ophth. Hosp. Reports, vol. vi. p. 90.

[13] Vide p. 307 of A Treatise on the Diseases of the Eye, by Henry D. Noyes, A.M., M.D., 1881, 8vo. pp. 354.

[14] Loc. cit.

[15] See details of a probable case on page 120 of vol. ii. of Tyrell on Diseases of the Eye, London, 1840.

That this case may with propriety be added to the number, I think there cannot be any question, as I saw the patient immediately after the attack, and watched him periodically to the time of this writing, therefore not allowing any passing symptoms to escape; and besides, which is of the utmost importance, there were not and are not any evidences in his good eye of part inflammation. The fact that the arteries and veins are normal in comparative size, calibre, colour, course, and shape; no appearance of pre-existing splotches or hemorrhages; nerve, although exceedingly dirty red-gray, not prominent or depressed; vision for form normal; accommodation fair; peripheral and central colour-perception very good for his time of life; all cause me to throw out the idea of past neuritic inflammation on that side.

There might be many theories given to account for the cause of this one-sided choking, but of all I think but two are in any way tenable.

First: That there is a circumscribed chronic pachymeningitis in the left anterior and middle fossa; idiopathic in type; creeping backwards outwardly; involving a few of the nerve-sheaths at their foramina; producing œdema in their subvaginal spaces, with consecutive neuritis and partial atrophy. No selective action for the attack upon the nerve, merely accidental, dependent upon the course of the progress of the disease.

Second: That there is a new growth, very chronic in its development and course, situated in any part of the brain, causing increase in the formation of arachnoidal fluid, with pressure in all directions, and accidental passage of the lymph through a few of the weaker foramina into the nerve-sheaths, producing incomplete choking of the nerve involved, which in some few instances has caused consecutive inflammation with partial atrophy.

*Colour-blindness.*—By reference to the clinical notes it will be seen that, besides the first, there were two examinations of the left eye made with Holmgren's wools. One, eight months after the choking, and the other, two and a half months later. The first determination showed entire loss of green, with partial perception of red, whilst violet had much of its red thrown out. Blue and yellow both good. The second gave entire absence of green, red, and blue; yellow still faintly persisting. This was dependent upon several conditions. First: The nebula on the cornea, hardly worth mentioning as it would merely dull the intensity of the colour, just as if a normal eye would attempt to appreciate a colour through a slight mist or a light fog. Yet I do mention it to show that it has been taken into account, and was considered of sufficient importance to modify a definite comparison with the opposite organ. Second: Pressure, with consequent tissue degeneration. Third: Sanguineous extravasation in the macular region. Fourth: Deficient blood supply to the retina. Fifth: Subsequent tabetic change.

The study of the loss and changes of colour in the left eye is extremely

important, because they were noted from the beginning, and the different passing phases so accurately defined, that delicate and almost absolutely correct answers were gotten in reference to the degree of absorption of the hemorrhages, and the amount of return of the viability of the damaged nerves. There remained at the acme of the choking nothing but shadings and gradings of grays. (The yellow-blue sensation of light in looking at a white object I am almost convinced was purely subjective, yet not to be too dogmatic in the assertion of positive achromatopsie, I will merely assert xanthokyanopie,[1] as this does not interfere with the study of the case.) The conducting fibres were pressed upon, and the receiving fibres buried under a semi-opaque substance, hence their physiological actions were reduced to a minimum, and almost total annihilation of colour-perception the result; the amount of remaining colour being the exact equivalent of the amount of remaining power. This was the primary acquired colour-blindness, totally different from the secondary acquired colour-blindness dependent upon secondary nerve change through consecutive nerve-tissue inflammation; the former, capable of amelioration, and the latter incurable. All this was the result of the localized pressure upon the nerve with its consecutive atrophy, totally distinct from the tabetic changes which came on later; the nerve having had superadded to its atrophy from pressure and inflammation a true gray degeneration like that in the right optic nerve causing a greater amount of atrophic change, with a proportionate relative lessening of colour-vision.

To save time and space I have combined my study of the grouping of the colour-symptoms into a series of definite conclusions which I think may be applied to all similar cases.[2]

1. In optic-nerve choking, there is a primary acquired colour-blindness; the amount dependent upon the amount of œdema and its immediate consequences.

2. There is a gain in colour-perception after the occurrence of the primary form of colour-blindness, the amount being directly dependent upon the amount of restoration of physiological ability of the diseased nerve-tissue.

3. There is a secondary acquired colour-blindness, coming on after the

[1] Mauthner's definition of yellow-blue seeing. "Vorträge der Augenheilkunde" von Dr. Ludwig Mauthner, 1879, Heft 4, s. 179. (Farbensinn.)

[2] The colour-vision of the right eye having merely gotten to the very early stage of dyschromatopsie, I am unable to give any rules from this case as to the order of loss of colour dependent upon the tabetic condition. Erb states that in locomotor ataxia green goes first, then red, finally yellow and blue. Charcot says that the perception of yellow and blue persists in a high degree and for a long time. The fact that this experience of these two observers, in cases of tabes, does not materially differ from my own in the observations made upon the left-sided choking with its atrophy in the case before us, together with the comparative study of the visual fields, makes me think that the order of loss of colour-perception is the same in each form.

intermediate gain, the result of inflammatory tissue change or degeneration which lessens physiological action to an equivalent with the amount of nerve-tissue left.

4. The secondary form is incurable, and either remains stationary, or passes on to total colour-blindness.

5. In both the primary and secondary forms of this variety of acquired colour-blindness, green followed by red is the first colour to go; then blue, and lastly yellow.

6. The gain in colour-perception, after primary acquired colour-blindness, takes the following order: yellow, blue, red, and green.[1]

7. Definite conclusions in reference to the amount of physiological power (physical condition) left after the cessation of optic nerve pressure and consecutive inflammation may be gotten by average comparison of a number of similar cases.

8. These conclusions have no bearing upon cases of simple degeneration of the optic nerve, as in this form of the disease; there cannot be any distinction drawn between a primary and a secondary colour-blindness, there being nothing more than a progressive colour diminution, passing through the stage of dyschromatopsie, and terminating in total colour-blindness.

It is very important to note the comparative changes in the extent and kind of the peripheral form and colour vision of the two eyes. The almost utter annihilation in the left eye of form and colour fields; the gradual gain in the amount of area and the number of colours seen; their order of progression; the forms of the fields and their relative sizes, when the nerve had gained its utmost; the secondary contraction, and the final changes in the colours themselves. The contraction of the fields of the good eye, with no change in colour, showed slight, but progressive degeneration.

I shall not enter into the reasons of my expunging all other forms of the cause of these changes than those given, but shall briefly summarize the past and existing conditions, and from these add strength to my previous deductions. In the left eye, the primary reduction to light perception; the intermediate gain, which for yellow and blue came back, in areas and kind, equal to that of the good eye; the area for red, when the nerve was its best, equalling about one-fourth the size of that in the right eye, yet the colour never called anything but pink; green never regained; form field as good and as large as its fellow. The secondary loss, shown by the marked contraction of all of the fields, as compared with that during the intermediate gain; and the change of the pink (red) field to the mixed one, containing a central "dirty-brown." In the right eye, the slow, pro-

[1] See note of a case by Chisholm, Roy. Lond. Oph. Hos. Rep., vol. vi. p. 214.

gressive concentric contraction of the form and all the colour-fields, with no observable changes in the colours themselves.

Careful study of these conditions has led me to a few conclusions:—

1. In optic nerve choking, with subsequent atrophic change, the visual fields for form and colour pass through three distinct phases: first, a primary loss of extent and kind; second, an intermediate gain; third, an ultimate loss.

2. In simple degeneration of the optic nerve, there is merely a diminution in the areas of the form and colour-fields, with decided and definite changes in the colours themselves, from the very beginning.

3. The fields of secondary change from œdema (Stauungs-papilla) are exactly the same as those of any simple degeneration of the optic nerve, provided the tissue change exists in similar places.

4. In every degenerative change (equal in transverse section[1]) of the optic nerve fibres situated anterior to the chiasm, there is always a concentric and relative limitation for both the form and colour-fields of the side involved.

5. To have concentric and equal contraction of the visual fields in degeneration of both optic nerves, the degenerative process must involve equally in transverse section both trunks anterior to, or posterior from, the chiasm, or the entire chiasm itself; although these degenerative spots need not occupy similar positions.

The investigations which were pursued with central colour-perception are well worthy of note. Commencing in the left eye with candle-light perception, appearing as a yellowish body at five metres' distance, I found that in three weeks the various colours had partially regained themselves; curiously, first appearing as "sparks of fire." Red perception (always called pink) reduced to one-eighth, as compared with the other eye; green never regained, merely turned blue; violet, designated as pink, with a yellowish cast; blue about as good as its fellow. Yellow not taken at this time. At the third examination made seven months later, I found that there had been a marked decrease; red, which had been a "good pink," had faded to a "light pink fire," becoming darker upon greater exposure, and at last passing into "lead-colour;"

[1] It may be observed that I use the expression "equal in transverse section." This I do intentionally, not meaning equal in any one narrow zone, but that there is, by the time we have reached the intra-ocular tip from the point primarily involved (or *vice versa*), an atrophy equal in all parts of the entire nerve distribution to the retina. Thus, there may be zones and girdles of degeneration, or even insulated scleroses, which, if taken all in all, become evenly distributed across the entire nerve or nerves, and produce equal and concentric narrowing of the visual fields. This reasoning cannot in any way conflict with the researches of either those who hold to partial decussation, or those who believe that the decussation of the optic nerve fibres in the chiasm is complete.

green had lost its blue tinge, appearing as varying "sparks of fire," getting brighter and lighter as more surface was exposed; violet appeared as "a yellow spark of fire," becoming lilac;[1] blue diminished to mere "fire spots;" yellow recognized as "lemon colour." Although central colour-perception was deficient in the patient's right eye at the first visit, there was a gradual lessening of power without any change of colour.

Study of these conditions only adds confirmation to the conclusions arrived at in the researches with the coloured wools and the visual fields; showing that this modified method of examination is absolutely under the same laws as the others, having the same changes, and passing through similar phases. Hence, the former conclusions will also hold good in this series of observations; it being my belief that such experiments serve as indices for the exact estimation of the amount of optic nerve tissue changes.

*Smell.*—At first sight, this symptom appears to complicate the case, but I think, if careful survey be made of the patient's past history, together with proper appreciation of the existing conditions, we not only tend to lessen its seemingly complex nature, but really add strength to the hypotheses brought forward early in the paper. The patient said that he had noticed difficulty in smelling on the left side for twenty years past, dependent, he thought, upon his left nostril not being so free. That there may have been obstruction in the canal, I in no way deny, and that the defective smell was a mere factor in a chronic catarrh, I do not doubt; but I am positive that when I examined him, and that not only once, but repeatedly, I could not distinguish, as far as I was able to see, any change in the mucous membranes, or a marked difference in the calibre of the canals; and that air was ejected through the left side with the same force as through the right. Not only these facts, but his present recognition of the decided difference in the power of the sense on the two sides, which I confirmed by experiment, all made me seek further for the entire cause of the trouble. The objections that might be brought forward to my thinking the cause of the disorder of smell as intracranial are of little weight, because the two conditions could have been coexistent. The local changes having undergone resolution with restoration of the parts involved to their normal condition and action; whilst the intracranial disease still persisting or forming gave the same loss of physiological actions as heretofore.

We all know that loss of smell may arise from several causes, prominent among these being deformities and inflammation of the nasal appendages themselves, such as acute and chronic thickenings with adhesions of the mucous membrane, polypi, bone lesion or paralysis of some of the super-

[1] This is very curious, yet I give it as expressed by the patient, although I do not think it militates in the least against the order of loss and gain, as he may have seen some of the pink in the violet, and this, combined with his yellow vision, has given him a vague and imperfect impression of lilac.

ficial muscles.[1] These conditions not existing, made me throw out any notion of a peripheral origin as being the entire cause of the unilateral dyosmia. The question, then, resolved itself into a central or an intermediate lesion. Ferrier,[2] by comparative experiment, places the centres of smell and taste at the tip of the temporo-sphenoidal lobe. Further investigation has shown that the loss of action is on the same side as the intracranial lesion, owing to the non-decussation of the olfactory paths in the anterior commissure. I do not think that there can be a lesion of these centres in this case, because, as far as I can get any history, or am able to investigate, there has not been, and is not any deviation from the normal in the sense of taste, which would have taken place if we accept Ferrier's and the later views upon their relative situations. Therefore, all that is left for us, is the intermediate tract, and here I think we can confidently locate the trouble: Inflammatory thickening of the dura mater on the left side of the cribriform plate, part and parcel of the more extended thickening. Of course, I can conceive of a cerebral tumour producing almost identical one-sided symptoms.

*Reflex Movements.*—The entire absence of the so-called "Argyll-Robertson phenomenon" is quite interesting, although the existence of a break in the reflex of a tabetic pupil, when exposed to light, is by no means universal. Jackson speaks[3] of a case of tabes dorsalis of seventeen years' duration, in which this symptom could not be found. Gowers broadly asserts that it "cannot, with all our care, be invariably obtained in persons beyond middle life."[4] This latter assertion I can but re-echo, having seen two patients with well-developed locomotor ataxia, in whom, with the utmost care and patience, I could not get this symptom. Prof. Erb's statistics show but eighty-four per cent., a little over one-half of these being in the preataxic state. Bramwell[5] is of the opinion that the involved point is probably situated either in the corpora geniculata, or between them and the reflex centre; the abolition of the reflex being independent of the cord lesion. As far as my own reasoning goes, I cannot see why it should be a necessary factor in all cases; its occurrence being dependent upon the accidental position of the lesion, somewhere in the arc of reflex action to light.

The abolition of the superficial reflexes was probably the result of three causes: the age of the patient; pathological changes connected with de-

[1] The right-sided partial immotility of the facial muscles did not seem to give rise to any of these last symptoms, hence my reason for expunging any probable influence from this phenomenon. Had they existed they would have served as arguments against a peripheral cause for the left-sided diminution of smell.

[2] The Functions of the Brain, 1876, 8vo., pp. 323.

[3] The Ophthalmic Review, July, 1883, p. 213.

[4] Ibid., p. 212.

[5] Pages 228 and 229 of "The Diseases of the Spinal Cord." By Byron Bramwell, 1882, 8vo., pp. 300.

generation of the posterior horns of gray matter; and intracranial disease.

The study which I made of the deep reflexes, more especially that of the "patellar-tendon," is valuable in showing a possible primary excitation of the postero-external columns, in the developmental stage of a tabes dorsalis, more pronounced on the left side; the nerve tubes in the affected part gradually undergoing degeneration equally on both sides, with consequent equal relative diminution of the reflex action. It may be that the unequal exaggeration was partially due to the cerebral lesion, as I am positive, from what little experience I have had, that in cases of unequal optic nerve atrophy, there is often a marked difference in the "patellar-tendon" reflex upon the two sides. Again, the unequal exaggeration in the myotatic contractions may have been wholly the resultant of the intracranial trouble, which, upon the superaddition of the degeneration of the nerve-tubes in the postero-external columns, has become relatively equally dimini hed.

The other motor and sensory disturbances point towards the double origin of the disease. The isolated incoördination of the external perineal muscles,[1] and the diminished response of their nerves to the faradic current, together with the rapidly diminishing "patellar-tendon" reflex indicate that the greatest degeneration is in the lumbar cord.

## GENERAL REMARKS.

We think we can notice four distinct factors of disease, as being the causes of the patient's present condition.

*First.* The early appearance in life of a polypoid growth in the right ear, which upon being extracted caused obliteration of the right auditory canal, and destruction of the contents of the middle ear. The partial loss of motility of the facial muscles upon the same side took place at the same time through peripheral traumatism; although this was not of sufficient moment to cause interference with their electrical reactions.

*Second.* A chronic catarrhal inflammation of the left middle ear, of an exceedingly rare and almost unique type. The peculiarity consisting in the formation and the retention of a sero-mucous fluid within the tympanic cavity, which required frequent evacuation; each operation productive of a marked increase in audition. The tendency to the accumulation of the liquid, at last ceasing, with a return of the power of hearing to a relatively normal standard. This was purely local in origin.

*Third.* This conclusion is divided into two probable conditions, there not being any proof of an individual or a combined existence.

*A.* A chronic pachymeningitis, limited to the anterior two-thirds of the left base, involving a few of the nerve-sheaths at their foramina; causing subvaginal œdema, with consecutive neuritis and partial atrophy.

[1] First pointed out in 1875, by Dr. J. Hughlings Jackson.

*B.* A new growth, very chronic in its development and course, situated in any part of the brain. The neoplasm causing pressure in all directions, with accidental passage of arachnoidal fluid through a few of the weaker foramina into the outgoing nerve-sheaths; this serous exudation producing incomplete choking of the nerve, followed by inflammation and atrophic degeneration.

*Fourth.* Sclerosis of the posterior columns of the spinal cord; the disease having advanced as far as the beginning of the stage of full development, without complication or extension of morbid process.

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## ARTICLE VI.

### STERILITY DUE TO CONTRACTION OF THE UTERINE CERVICAL CANAL, COMPLICATED OR NOT BY FLEXIONS OR VERSIONS, SUCCESSFULLY TREATED MECHANICALLY BY THE UTERINE BOUGIE.

By E. A. SPOONER, M.D., of Philadelphia.

UNDOUBTEDLY the most numerous cases of sterility are due either to a simple contraction of the cervical canal, or to such contraction complicated with one of the various flexions or versions of the uterus; and although treatment of the former by dilatation and of the latter by pessaries has long been in vogue, patients and gynecologists have shared their disappointments innumerable.

Convinced that pessaries in women who have not borne children frequently give rise to irritation or inflammation, thereby adding another impediment to conception, I have long since abandoned their use in the treatment of these cases, employing such supports for patients requiring relief from prolapses or other displacements without regard to the question of conception.

Fortunately, many cases of flexion or version are amenable to the treatment of the uterine bougie, and when occurring as complications of a partial atresia of the cervical canal, the correction is readily made coincident with the dilatation. I have, indeed, been surprised at the ease with which long-existing and extreme flexions have yielded to the plan of treatment which I am about to describe.

The bougies which I use are of steel, nickel-plated; they are 10½ inches long, the extremity slightly tapering for about half an inch; the curve occupies 2½ inches, being an arc of a circle of 3¼ inches radius, the shaft is 5½ inches, and the handle is 2½ inches in length, upon the anterior surface of which is stamped the size in French and English scale. The sizes which I have found requisite are 11, 13, 15, 17, 19, and 21, French scale.

My mode of treatment is as follows: If the patient presents a moderate contraction, one admitting with considerable resistance No. 11, I introduce the first three of my series in quick succession, and repeat the operation every week until the larger numbers are easily introduced; this operation, consisting of the introduction of the entire series, is repeated weekly for six weeks or two months, after which intervals of two weeks are allowed until two more months have passed, when only one operation each month, consisting of the introduction in quick succession of Nos. 13, 15, 17, and 19, is required; this final series of dilatations I am careful to subject my patient to on the day following the cessation of menstruation.

With patients presenting flexions or versions I frequently allow a medium-sized bougie to remain introduced one to two hours, giving a nurse or attendant instructions for its removal. I also enjoin upon the patient to remain in a recumbent position, with the body inclined in the direction opposed to the displacement, thereby greatly aiding the restorative action of the bougie; thus, with a right lateral version I put the patient upon her left side; with a posterior version I put the patient on her abdomen, etc. etc.

In extreme contraction it is sometimes necessary to precede the use of the bougie by an operation with hysterotome, and I have found with this instrument that three slight incisions are better than one or two deeper ones. After the cutting I leave a wax or gutta-percha bougie $3\frac{1}{2}$ inches long, introduced for $2\frac{1}{2}$ inches within the uterus, permitting this to remain for 36 to 48 hours, following its removal by the dilatations with the metallic bougies and proceeding thereafter the same as with ordinary contractions.

Mrs. D., my first successful patient, consulted me in June, 1862. She had been married nine years, had menstruation regularly, but suffered frequently from dysmenorrhœa. The No. 11 bougie was introduced with some difficulty, taking a right lateral direction. I pursued the treatment described above, using the first three numbers about four weeks, the entire series for two months, and the intermediate, say 13, 15, 17, and 19, only twice, when conception followed and she became a mother.

Mrs. K. consulted me in October, 1863. Had been married eleven and a half years. Menstruated regularly, but suffered severe dysmenorrhœa every alternate period. The bougie indicated a retroflexion. I introduced the entire series, giving considerable pain. Left No. 15 inserted for an hour after the first seven operations, keeping the patient on her abdomen during the retention of the bougie, and directing her to occupy this position as much as possible when in bed. The intermediate series were used four months on the days following the cessation of menstruation, after which she became pregnant, and is now the mother of six children.

Mrs. M. consulted me in January, 1865. Had been married thirteen years; menstruated irregularly, and suffered frequently from dysmenorrhœa. This was a case of extreme contraction. I made three slight incisions with the hysterotome, one anterior and two lateral; left wax bougie in cervical canal for 48 hours; followed its removal with daily introduction of Nos. 13, 15, 17, 19, and 21 for one week, and weekly introduction of 13, 15, 17 and 19 for three weeks, and monthly introductions after ten menstruations, when she became pregnant, and is now the mother of three children, and enjoying perfect health.

Mrs. H. consulted me in May, 1881. This patient had been married nine years; had menstruation regularly, sometimes attended with pain. I found her wearing a closed lever pessary, inserted by a well-known gynecologist, who had been treating her for sterility and retroversion for two years previous to the time she was placed under my charge. I removed the pessary and gave her a mild astringent injection to relieve the leucorrhœa caused by the pessary, and subjected her to the bougie treatment, introducing the entire series at one visit, repeating weekly for one month, and monthly for four months, when conception followed and she gave birth to a son the following August.

The above are selected from my list of twenty-seven successful cases, as typically illustrating my plan of bougie treatment. It is proper to note that in those cited no therapeutic agent was resorted to; the only directions that were given those patients were such as related to the general health.

Chlorotic patients, such as suffer scanty and painful menstruations, are greatly benefited by the exhibition of the tartrate of iron and potash during the inter-menstrual periods; but it is important to suspend this treatment immediately upon the eruption of the menses, and to renew it only after menstruation has entirely ceased. On the other hand, with women who suffer from excessive menstruation and in whom only a uterine congestion is locally recognizable, iron is of course to be carefully avoided, and the bromides, belladonna, quinine, etc., administered. But it is to the uterine bougie that entire credit belongs for the success which has attended my treatment in more than twenty cases of sterility occasioned by stricture of the cervical canal.

I cannot close this article without calling the attention of the medical profession to the fact that in my hands and in those of my friend Dr. Skillern the No. 11 bougie of my series has been proved to be peculiarly useful as a uterine sound. It would seem that the curve which I have adopted is practically the one which follows the normal longitudinal axis of the womb, and consequently it rarely happens that much difficulty is experienced in its use.

In extreme retroflexions it may sometimes be necessary to aid the progress of the bougie by pressure against the posterior wall, with a finger

introduced into the rectum; but after two or three insertions, allowing the bougie to remain in position an hour or so, and the patient observing the directions above described, there will be little trouble in proceeding with the treatment. I will add that Mr. Teufel, of 114 South 10th Street, has succeeded admirably in making my uterine bougies according to my wishes.

The accompanying cut represents my bougie, showing relation of curve to shaft, etc.

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## ARTICLE VII.

### A CASE OF AINHUM. By LOUIS A. DUHRING, M.D., Clinical Professor of Diseases of the Skin in the University of Pennsylvania.[1] With MICROSCOPIC EXAMINATION by HENRY WILE, M.D.

THE notes of the following case of ainhum, together with the specimen, have been sent to me by Dr. George B. Simpson, of Weston, West Virginia, by whose courtesy I am enabled to present this report.

The patient is a negro, forty years of age. When about ten years old he noticed a furrow in the digito-plantar fold of the little toe, upon both feet, which gradually began to increase with considerable constant pain. The toes gradually enlarged, and, in the language of the patient, "the skin seemed to deaden on the outside, but down in the creases was very tender and painful." Dr. Simpson first saw the case ten years ago, at which date one toe seemed nearly amputated, and could have been easily cut off with a knife without loss of much blood and without pain. Time finally amputated one toe about two years ago. This specimen Dr. Simpson was unable to obtain, as the patient was superstitious and insisted upon burying the member. The other toe dropped off a few months ago, and was at once placed in alcohol and prepared for microscopic examination.

In addition to the above history, Dr. Simpson learned the following interesting facts: That the father of the patient lost both toes in the same way; one he cut off with a chisel. The mother, moreover, is at present suffering with the same disease, but has not as yet lost either toe. She desires to have them amputated, as she cannot wear shoes with comfort.

[1] Read before the American Dermatological Association at its seventh annual meeting, August 29, 1883.

These statements are of interest as pointing to heredity as a cause, to which factor in the production of the disease Dr. H. Weber has already referred.[1]

I am indebted to my assistant, Dr. Henry Wile, for the following exhaustive study of the microscopic appearances of the specimen.

"Macroscopically, the specimen consists of the ungual phalanx of the right little toe. It is irregularly spheroidal, is about one inch in diameter, and on the dorsal surface is a well-developed nail. On the proximal end is the place of attachment, consisting of a round, one-quarter inch in diameter, somewhat uneven surface with a concentric appearance very much like the end of a coil of thick paper. The entire specimen is of a pale-whitish hue, extremely hard (it having been preserved in alcohol), though presenting a swollen, œdematous appearance.

Sections prepared for microscopical study were made perpendicular to the plane of the attachment; the same were stained with borax carmine, cleared up in turpentine, and mounted in Canada balsam.

Under low power (25) the horny layer of the epidermis is seen to be increased in thickness, compact, though easily separated into layers; slight separations in the form of irregularly-shaped linear empty spaces frequently being seen. Passing downward towards the rete, the epidermis assumes a marked scalloped form, which is indicated by a few layers of more deeply stained cells. This scalloped form or arrangement of the cells is occasionally continued through all the layers of the epidermis, appearing on the surface in the form of papillæ-like elevations and depressions.

The papillary layer of the epidermis is very deep, each papilla being elongated, slender, or spindle-formed, with pigmented borders. Some end in sharp points, others are more rounded, while the pigment is rather unevenly distributed, in some places being quite extensive, in others scanty or even wanting.

The papillæ of the corium are also elongated, and are much enlarged, being plainly visible to the naked eye. The enlargement is specially marked around the face where they present a swollen appearance. Their capillaries are greatly dilated, winding, and packed with corpuscular elements. The perivascular space is occupied by a deposit of small round cells, which, as we pass downward into the different layers of the corium, increase in extent, in some places being considerable, and extending in the meshes between the bundles of the surrounding connective tissue. The connective tissue and smooth muscular tissue, arranged in bundles of various thickness, cross and intervene so loosely as to leave larger and smaller empty spaces. This is more noticeable in the lower layers of the corium in the vicinity of the sweat glands; and near the small bloodvessels, especially the small veins and capillaries, the appearance is such as would indicate the presence, during life, of considerable exudation whose only residue consists of scattered, smaller and larger, collections of lymphoid cells, which occupy these spaces.

The bloodvessels are numerous, the arteries for the most part being contracted and full of corpuscles. The adventitia of the large arteries is noticeably increased in thickness, as are also the media and endothelial lining. The capillaries and small veins of the upper layers of the corium, and particularly those vessels forming plexuses about the sweat-glands, are all

[1] Trans. Path. Soc. Lond., vol. xviii. p. 277.

engorged with blood-corpuscles. The veins, especially the larger ones, are empty, while the lymphatics are greatly distended; and, the contents having been fluid containing little cellular matter, their lumen is empty. In some places the pouch-like dilatations are marked, and contain some cellular debris. Here and there in the upper layers of the corium parts of ducts of sweat-glands are met with whose walls and lining cells present an atrophic appearance. The coils of sweat-glands are numerous, and, lying between the bundles of smooth muscular tissue in the lower layers of the corium, they have a small lumen, and present the same shrunken, contracted, atrophic condition as the ducts. Between the coils of these glands there is an extensive growth of areolar connective tissue containing fat cells and a varying amount, sometimes considerable, of lymphoid cellular infiltration.

The subcutaneous connective tissue contains a scant amount of fat.

With higher power (250) the appearances above described were confirmed, and the character of the changes in the tissue elements was brought out in clearer definition. The cells composing the horny layer of the epidermis are swollen, occasionally cloudy and granular, but for the most part present a peculiar hyaline appearance. They contain a nucleus which grows smaller as we ascend to the surface. The pigment in the rete Malpighii is confined to one layer of cells—that layer of cylindrical cells which is situated next to the papillæ of the corium—the pigment being more extensive around the lower part and the sides than on the top of the papillary layer of the rete.

The capillaries of the papillæ and upper layer of the corium are greatly dilated and full of white and red corpuscles. The immediate neighbourhood of these vessels is the seat of lymphoid cell infiltration, which is more extensive in some places than others. Occasionally this cell infiltration has gone on to organization, forming connective tissue which appears as a ring around the vessels.

Between the decussating fibres of the connective tissue are also seen here and there variously sized collections of small round cells which apparently have no connection with any bloodvessel. Around and among these clusters many spindle cells are seen, which is an indication that the process of organization and formation of new tissue is going on. Further proof of this fact is found in the presence of a considerable amount of young, embryonic connective tissue in the immediate vicinity of these small round exudation cells.

In lower layers of the corium the bloodvessels, dilated and full of red blood corpuscles, are often surrounded with numerous fat vesicles, which are also found in great abundance in and about the coils of sweat-glands.

The sweat-glands lying in large spaces between bundles of smooth muscular tissue are surrounded by a plexus of capillaries and venules, which are also in a state of intense congestion. There are, besides this, large round alveoli filled with lymphoid cells, between which the parts of coils of sweat-gland may be observed.

Approaching the place of attachment the epidermis is observed to grow thinner gradually, and finally end in a point. It does not slant down smoothly in a straight line; it descends with step-like processes. The papillary body also ends abruptly, and the space beyond is occupied by closely connected bundles of connective tissue, intermingled with several strands of yellow elastic tissue. At the end or place where there was connection with the pedicle the tissue has the appearance of having been cut square by a knife.

The observations made may be briefly enumerated as follows:—

1. Increase in thickness of epidermis.

2. Enlargement and elongation of papillary body.

3. Bloodvessels of papillary body, also perivascular spaces, dilated and filled with red and white corpuscles.

4. The meshes of the connective tissue of the corium contain larger and smaller clusters of small round cells, which for the most part immediately surround the bloodvessels. In some places the cells composing these cellular collections have gone on to organization-forming tissue.

5. The lower layers of the corium are composed of loosely arranged bundles of connective tissue and smooth muscular tissue, between the bundles of which are variously sized empty spaces.

6. Bloodvessels are everywhere numerous—arteries, capillaries, venules dilated and filled with blood-corpuscles.— *Veins for most part empty.*

7. In the walls of the larger arteries there is a noticeable thickening of the media and adventitia, and proliferation of endothelium.

8. Lymphatics distended, but mostly empty.

9. Sweat-glands numerous, but atrophic.

10. About the coils of sweat-glands are numerous fat vesicles and round alveoli filled with lymphoid cells.

11. The tissue attached to the pedicle composed of connective and yellow elastic tissue closely packed together.

12. The epidermis observed to descend with step-like processes to the place of attachment.

13. Altogether the general impression which all the foregoing observations would tend to make in connection with a careful study and comparison of sections, is one that would be conveyed by the study of a tissue, the seat of a chronic *inflammatory œdema.*

As far as a judgment, based upon a microscopic examination of one specimen may go, I am led to believe, that the entire process is due to a disturbance of the circulation. Furthermore, that the cause of such disturbance was intermittent in its action. Such causes have been assigned by Dr. Da Silva Lima,[1] in the form of "limited, or localized scleroderma," and by Drs. Heitzmann and Atkinson,[2] in the form of a thin ligature applied "with a purpose and persistence." Believing in the intermittent action of the cause, which is clearly indicated by the condition of the tissues, particularly the bloodvessels, I regard the latter as the most probable explanation. Supposing a ligature to have been applied, the superficial veins suffering first from compression, it prevented the return of blood, while the deep arteries being free, continued to supply blood to the part and pass into a state of congestion in which there was some exudation into the surrounding tissues. The ligature being removed, the compression was relieved, and larger veins becoming free conveyed blood away from the part. That the larger veins were free, is shown by the specimen in which their lumen is for the most part empty. A reapplication of the ligature caused a repetition of the process, each time giving rise to more cell exudation, which finally brings about a condition known as *inflammatory œdema.* In this condition we find spaces between the bundles of tissue occupied by an exudation containing a considerable amount of cells, in contradistinction to the condition of simple œdema, in which the exudation contains little or no morphological products. The *inflammatory œdema* increasing, causes a compression of

[1] Archives of Dermat., Oct. 1880, p. 467. [2] Trans. Amer. Derm. Assoc., 1881.

the veins, which interferes with the return current, and keeps the part in a state of congestion. This in turn keeps up the inflammatory œdema which must sooner or later end in necrobiosis. The ligature, then, is in my opinion probably the cause of the *disease*. Of the points enumerated, the twelfth is the only one which sheds any direct light or furnishes any tangible evidence in favor of such a mode of procedure. On one section 8 step-like formations were counted, on another, 7.

I wish to state, in conclusion, that only skin and subcutaneous tissue were examined,—not the bone."

Concerning the cause of the disease difference of opinion prevails. The view expressed by Dr. Wile, namely, that a ligature must be regarded as the cause, is that which has already been put forth by Drs. Heitzmann and Atkinson, in their communication to this Association, and is based solely upon microscopical study. On the other hand, such a cause is not even hinted at by such accurate clinical observers as Da Silva Lima. Now, however, that it has been suggested, it behooves clinicians to verify or disprove the assertion.

But few cases of the disease have been reported in our country. Its geographical distribution includes chiefly the West Coast of Africa, and certain countries in South America, more particularly Bahia, Rio de Janeiro, and Buenos Ayres. But cases have also been encountered in North Carolina, by Drs. Hornaday and Pitman,[1] while the case in the present report occurred as far north as West Virginia. As the disease becomes better known, it will, doubtless, be found that it is met with throughout our Southern States, though, probably, as one of the rarer diseases.

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## ARTICLE VIII.

### OSTEOTOMY FOR BOW-LEGS. By W. H. CARMALT, M.D., Professor of Surgery in Yale College, New Haven, Connecticut.

LIZZIE DOTY, aged 5 years, was admitted to the New Haven Hospital on April 8, 1882, with extreme curvatures outwards of the tibiæ and fibulæ of both legs, somewhat more marked in the left than in the right. The child was well nourished, in face and chest almost robust; except for slight epiphyseal enlargements at the carpo-radial articulations, there was no other deformity than those associated with the bow-legs. Each femur had a well-marked *anterior* curve, but no lateral; the condyles were all on the same horizontal plane, and a straight line drawn from the centres of the patellæ to the apices of their corresponding great trochanters passed as nearly as might be along the median lines of the femoræ. On applying the internal condyles together, the legs below the knees crossed in the manner represented in Fig. 1, in which the external side

[1] North Carolina Medical Journal, Sept. 1881.

of each foot to the ankle was, when the child was held in the erect position (for she was quite unable to stand so), applied to the floor. Bringing the ankles together the knees were widely separated, and in resting the foot flat upon the floor, quite an angle was made laterally with the leg

Fig. 1.

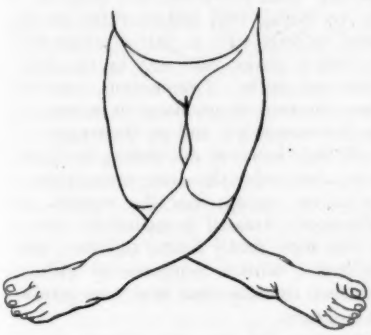

Fig. 2.

(Fig. 2). This angle was principally due to a bend in the tibia and fibula just above the ankle-joint, but it was also evident that the main curvatures were in the upper part of the legs just below the tuberosities of the tibiæ. The child could not balance herself in this position with the feet close together, but required some external support. When allowed to stand alone the position taken was with the feet straddled widely apart, so that in walking she swayed from side to side with a most ungainly waddle; she could walk but a short distance. On April 24, with the assistance of Dr. Chas. T. Poore, of New York, to whose kind advice much of the good result of this case is due, I divided by separate incisions both tibiæ and both fibulæ at points about one inch and one and one-half inch respectively below the level of the tubercles of the tibiæ, using Macewen's chisels with a mallet in making the sections of the bones. During the operations the wounds in the skin were kept irrigated with a two and a half per cent. solution of carbolic acid. After the fractures were accomplished the legs were brought into as nearly a straight line with the femurs as possible, all coagula were carefully pressed out of the wounds, and the latter closed by borated cotton and strips of adhesive plaster; plaster of Paris splints from knees to ankles were put on, with the legs as straight as possible, and the two limbs were fastened together.

The morning after the operation the temperature was 99°, the child was restless, but did not complain of pain; on the second day fenestræ were cut in the bandages opposite to the wounds, no discharge was found on the cotton, but one external wound, that over the left tibia, was not united. On the afternoon of the fourth day after the operation the temperature arose to 99.8°, remained so the next morning, but fell to 98.2° in that afternoon, and never rose above 99° again during her stay in the hospital.

There was never any suppuration from the track of the wound; the splints were removed on May 28, just one month from the operation,

because of some excoriations of the skin at the edges of the fenestræ. The union of the bones was quite firm, the curvatures (angularities) at the upper part of the legs were quite removed, those at the lower part being, of course, still uncorrected. The lateral ligaments of the knee-joint had been so stretched, from the manner in which formerly the weight of the body had borne upon them, that the joint had quite a perceptible lateral movement; the patient was, therefore, not allowed to walk, the legs were kept straight by being tied together for several weeks longer. She was then allowed to walk with a pair of shoes with braces reaching on each side of the limb to about half way up the thigh, with fore and aft hinge-joints at knee and ankle. Locomotion, however, was still quite awkward, but she was allowed to go home to return for further treatment, which she did on November 25, and on December 17, osteotomy was again performed on all four bones at one sitting at points about three inches above the malleoli, and under the same precautions as to sepsis as before, except that the wounds and legs were afterwards dressed in carbolized cheese cloth. The legs were firmly bound together, after being straightened with a compress of uniform thickness between them, so that they were parallel from ankles to knees.

Fig. 3.

The temperature did not rise above normal until the afternoon of the second day, when it reached 98.9°, which point it also reached the next afternoon; after that it fell and never rose above 98.4° again. On the third day after the operation the carbolized dressings were removed as a slight carbolic eczema had been excited and borated cotton was substituted. On December 24, the external wounds having quite healed, the legs were put up in plaster of Paris splints. On January 27 these were removed, and the legs bandaged together with a straight, short splint between them reaching to the knees. On February 17 the splints were removed and the shoes with braces put on; she walked fairly well, but from long habit separated the feet widely, and did not bend her knees much. She improved in this respect, however, and at this date, August 13, 1883, one would hardly remark that there had been any deformity. The photograph of Fig. 3 was taken on February 24, the date of her removal from the hospital.

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## ARTICLE IX.

### ON THE TREATMENT OF HAY-FEVER AND ALLIED DISORDERS.

By HARRISON ALLEN, M.D., Prof. of Physiology in the Univ. of Pennsylvania.

IN the number of this JOURNAL for January, 1880, page 61, the writer contributed an article on the treatment of chronic nasal catarrh, and drew

the following conclusions as the result of the study of an important group of cases:—

"Obstruction is fatal to the efficiency of the nasal chamber as a respiratory and olfactory apparatus. . . . When a point of contact exists between surfaces which normally should not touch, the indication for the treatment is to destroy it. . . . This is accomplished by local remedies applied to the mucous membrane at and about the place of contact; or, in examples of abnormal deflection of the nasal septum, by removal of the offending portions of bone. In the case of the inferior turbinated bone, the swollen and engorged tissues accompanying the inferior meatus may be removed by the knife. . . . Improvement is apt to occur at times when occlusions disappear. In a word, the restoration of the nasal chamber to its proper use, *i. e.*, as a respiratory chamber, is often alone sufficient to cure the disease. . . . As a rule, it may be said that obstruction is followed by loss of function and distress; and when such obstruction exists, it should be removed when practicable."

The writer believes these conclusions were original with himself, and when first presented in a verbal communication before the Philadelphia County Medical Society, on the evening of Sept. 24, 1879, were allowed to go unchallenged as to any claim to originality, while they were vigorously assailed on their own merits. After an additional experience of four years, the writer is able to endorse the conclusions formed at that time, and to apply them to a yet larger group of cases. Reference is made especially to the cases of nasal disorders ordinarily grouped under the term "Hay-Fever." An effort will be made to prove that, putting aside the question of the etiology of this curious affection, in practice it may be met on the same plane as any other nasal affection, and that the means of effecting its cure are simply to overcome the tendency to obstruction of the nasal chambers.

The symptoms of hay fever are always associated with some degree of obstruction of one or both nasal chambers. A cause of this obstruction is dilatation of the bloodvessels. There is no doubt that the local phenomena are in most instances the same, and that the multiform related symptoms, such as injection of the eye, headache, malaise, asthma, etc., are due to reflex vasomotor disturbances. But many patients report for treatment who exhibit swelling of the nasal mucous membrane, occlusion of the respiratory passages, and mucoid or semi-purulent discharge, without any of the related reflex phenomena. Yet a third and intermediate group exhibit perhaps a tendency to turgescence of the mucous membrane, together with one or more of the more common constitutional symptoms of typical hay-fever. Indeed there is nothing peculiar to the disease just named save its sharply defined periodicity, particularly in that phase of it where the periods of recurrence happen to coincide with the time of fruitage of certain plants, or the gathering of certain crops. In a small group of cases where, in addition, other signs and symptoms become prominent which would invalidate the above proposition, I am inclined to attribute them to mental impression—in some of the varied phases of hysterical or neurotic excitement.

Or the case may be stated in different language, as follows: In an imperfectly defined group of cases of nasal catarrh, a sensation of sudden obstruction of one or both nasal chambers is a conspicuous symptom. This sensation is accompanied by a constant change in the chambers themselves, viz., engorgement of the membranes over the turbinated bones, producing pressure against the septum and occlusion of the respiratory passages of the nose. The sensations are recurrent, but vary greatly as to the time of the day or the season of their return. With some patients they are nocturnal, and are associated with the recumbent position; with others they occur after meals only; with some they occur in the summer season; with others yet again in the winter. The sensations may be confined to either chamber, or be present in both. In aggravated cases they are associated with numerous reflex symptoms, among which may be mentioned lachrymation and hyperæsthesia of the conjunctiva, headache, and asthma. Patients having a disposition to obstruction during the summer and autumn report themselves as suffering from "hay-fever;" while those having alternating attacks in the right and the left chamber report with "nasal catarrh."

The cases exhibit one feature in common, viz., that the inferior turbinated bones lie well above the plane of the floor of the nasal vestibule.[1] It will thus be seen that the mucous membrane, which is known to be the most erectile, is also the most exposed to irritation from extraneous substances, and to changes in the temperature of the surrounding air. In many persons not the subject of "hay-fever" and allied disorders, the lower free portion, including, of course, the inferior border of the bone, lies below the plane of the floor of the nasal vestibule; and in ordinary inspection the inferior meatus is out of sight.[2]

The following cases will now be detailed in illustration of periodic obstruction of the nasal chambers. Of these, Cases IV., V., and VI. are alone to be considered as cases of hay-fever; and of these, Cases V. and VI. were typical ones. Yet it will be found that all the patients were relieved by essentially the same plan of treatment.

CASE I. A lady aged 40, of spare habit, light complexion, nervous disposition, and with hair inclining to red,[3] reported for treatment March 7,

[1] A number of cases are explained in the communication above quoted, page 69, as caused by the too free ingress of irritating currents of air, and the resultant continual exposure of the membranes to the contact of extraneous substances, and to abrupt changes in temperature.

[2] It is an interesting fact that no form of nasal chamber other than the one retaining the "raised" inferior turbinate is figured by E. Zuckerkandl (*Normal und Patholog. Anatomie der Nasenhöhle*, etc., Vienna, 1882). The writer has notes of many examples of the "depressed" inferior turbinate; indeed, in the adult, it appears in this country at least to be a very common variety.

[3] The descriptions of colour of hair, kinds of complexion, etc. have been inserted in place of the names of the temperaments, as defined by the older writers. Certainly in the United States, however different may be the case in England, the Iberian and

1882. Two years before she had suffered from a severe attack of acute coryza. From the time of the subsidence of this attack, the nasal mucous membrane was exceedingly irritable, and with this condition was associated a mucoid discharge from the nostrils. The chief symptom, however, for which she reported, and which existed entirely separate from the causes which excited the original coryza, was loss of rest, due to obstruction of both nasal chambers coming on after the patient had retired for the night. At times this obstruction would be announced immediately after retiring, but more frequently it would come on during sleep. The patient would then be awakened by the distress arising from mouth breathing, and be from that time unable to sleep. Owing to this disposition, a tendency to laryngeal catarrh and to loss of smell was noticeable.

An examination of the nasal chambers showed that the left chamber was the smaller, though no septal deviation was detected. The anterior half of the left inferior turbinated bone was somewhat erectile. When a cotton-tipped probe was pressed against the membrane, and then quickly withdrawn, the depression caused by the instrument was instantly obliterated. The same condition existed on the right side, but to a less degree. The muscles of the palate, especially the palato-pharyngei, were relaxed, the tonsils were small and concealed, and the vocal cords congested. The naso-pharynx and posterior nares were normal.

The patient remained under treatment until May 1, 1882, and repeated opportunity was afforded for inspecting the condition of the nasal chambers and throat. Not in a single instance was the obstruction complained of ever detected. Here was evidently a recurrent or periodic congestion, due to causes which may be considered as sequelæ of ordinary winter catarrh. The case was first treated by the exhibition of strychnia and iron, and the application of a constant electric current to the pharyngeal and nasal structures. The patient was directed to keep an electric battery in her chamber, and at the time of the commencement of the obstruction to transmit a current of ten cells directly through the cheeks. This was followed by the happiest results, but did not effect a cure. Destruction of the angiose tissue at the anterior ends of the inferior turbinated bones by the galvano-cautery was finally determined upon. After the eschars had separated, and the irritation attending the use of the agent had subsided, the tendency to obstruction arrested and the patient ceased reporting, all her symptoms having disappeared.

CASE II. A young man, aged 20, with light hair, fair complexion, and a tendency to comedo, with large pupils, pearly teeth, marked with an occasional milky opacity; and the nails of the hands showing white maculæ; reported with the symptoms of nasal catarrh, which had persisted from childhood. The discharge was mucoid and moderate in quantity. The patient enjoyed entire exemption from all the symptoms during the summer months. The times of greatest distress were while lying in bed at night, and while exposed to the wind on bleak, cold days. At such times nasal respiration was rendered impossible, distressing frontal headache and lachrymation were established, while an occasional asthmatic attack would supervene. In other respects the patient enjoyed good health.

Examination of the nasal chambers showed that the left was somewhat

Celtic types have so inextricably commingled, that one cannot retain the term temperament and its various subdivisions of "bilious," "sanguine," etc., with the confusing sub-subdivisions of "bilio-nervous," "sanguino-nervous," etc., with any advantage.

the smaller, and on this side the septum was deviated to a moderate degree. The anterior ends of both inferior turbinated bones were engorged and red, and were covered with a glistening, mucoid discharge. The right middle turbinated bone was large and engorged, pressing against the septum. The pharynx and palate were normal, while the posterior nares were occluded by yellowish-white masses, which were identified with the posterior ends of the inferior turbinated bones, but which appeared to be absolutely without bloodvessels.

The treatment consisted in the free application of the galvano-cautery to the turbinated bones, both in front and behind. The patient was susceptible to pain to an unusual degree, and demanded the use of an anæsthetic for the destruction of the posterior hypertrophies. The use of the cautery was decided upon after failure to include them in the loop of Jarvis's snare. The day following the treatment the patient reported with a sharp attack of earache, which was found associated with a large, dry plug of cerumen in the external meatus. After the plug was removed the symptoms subsided. After this treatment of the nasal mucous surfaces had continued for a period of six weeks the symptoms disappeared and did not return.

CASE III. A young lady, aged 18, a resident of a mountainous rural district, reported January 9, 1882, having complained for eight years of a distressing recurrent obstruction in the right nasal chamber. She had been subject to attacks of tonsillitis in childhood, was anæmic, and suffered from a disposition to nausea immediately after waking in the morning. The patient had been exceedingly nervous from infancy, had always been a poor sleeper, and had never been able to breathe through the left side of the nose. As a consequence of this disposition, when the right side was obstructed during an attack, mouth-breathing was necessitated. At the time of obstruction the patient complained of headache, lachrymation, and attacks of sneezing.

On examination the left nasal chamber was found obstructed anteriorly by an osseous spur, which extended the entire length of that portion of the vomer which is exposed at the ethmoidal notch. The chamber was, in addition, everywhere narrowed,[1] and the inferior turbinated bone freely exposed from in front. The right chamber was capacious, and at no point revealed existence of any abnormal condition. The naso-pharynx was exceedingly irritable, and its examination by ordinary means impracticable. By the aid of the finger passed above the palate, it was ascertained that a firm, rounded mass projected slightly beyond the plane of the left posterior naris, while the parts in the neighbourhood of the right posterior naris remained unimpaired. The tonsils were enlarged, but in other respects the pharynx was normal.

Treatment began at the date of the patient's first report, January 9, 1882, and continued until March 8, 1882. Without detailing the separate steps of this treatment, suffice it to say that it consisted in restoring the left nasal chamber to its use as a respiratory passage, and in destroying the disposition to turgescence on the part of the membranes in the right nasal chamber. To accomplish the first, the long osseous spur was filed off and the ethmoidal cartilage was separated from the lower

[1] The left nasal chamber in this case, and the left nasal chamber in Case VI., are instances of congenital narrowing of the nasal chamber, as defined by the author, without deviation of the septum. See *Trans. Amer. Laryngol. Assoc.*, 1883.

border of the ethmoidal notch, and pushed over to the right side. Applications were made by the galvano-cautery to the posterior end of the right inferior turbinated bone, and the same agent was used in reducing the size of the tonsils. This line of treatment, which was a severe test of the patience and courage of the young lady, was in the end successful. A recent report received from her parents, dated November 22, 1883, stated that the cure had remained permanent.

It is particularly interesting in this case to observe that as a result of the treatment not only did the disposition to headache, lachrymation, and sneezing disappear, but without the aid of any internal treatment whatever, all signs of the long standing anæmia and malaise disappeared. The nervous disposition so noticeably developed was, as a matter of course, not influenced by this local trouble, and the curious phase of vomiting persists. In this case it would have been easy to assume that all the symptoms were neurotic. The persistence of distress on the right side of the nose, and the well-defined periodicity of the attacks, were facts well established.

CASE IV. A merchant, aged 30, nervous disposition, brown hair, with light complexion, and a tendency to dark rings under the eyes, came under treatment April 11, 1881, having suffered for five years from attacks of obstruction of the nasal chambers, associated with tickling sensations, sneezing, headache, smarting of the eyes, etc. These attacks were entirely independent of weather, locality, and season; they were accompanied by the discharge of a thin mucoid secretion; would last from four to six days, and would then subside as suddenly as they appeared, but left the system depressed, and caused the patient to have the appearance of a man recovering from a debauch.

Examination showed the anterior extremities of both inferior turbinated bones swollen, œdematous, and macerated. The bones were in addition exposed throughout their entire length, that is to say, the inferior margins were clearly seen by the aid of direct light, and were everywhere above the plane of the floor of the vestibule. The membranes were pendulous. The chambers were symmetrical. The membranes were everywhere of an intensely red colour, and presented a striking contrast to the pallor of the dermal lining of the nasal wings. The examination of the posterior nares revealed a symmetrical vomerine swelling. The pharynx was normal.

The treatment, which extended over a period of one month, consisted in using the galvano-cautery freely over the anterior extremities of both inferior turbinated bones. These applications were accompanied by more than the usual amount of distress, the patient being exceedingly sensitive to pain. When the patient had recovered from the effects of the treatment and the eschars had separated, the symptoms disappeared and did not return.

CASE V. A farmer, aged 21, having light-brown hair, hazel eyes, and fair complexion, came under treatment January 26, 1883. When six years of age he had suffered from an attack of membranous croup, and from this time on, had suffered periodically with summer asthma. The attacks would begin about the first of July and last well into the autumn. They were accompanied by a constant disposition to lachrymation, by nasal obstruction, and by tingling at the roof of the mouth. During the last four years, he had had in addition winter catarrh, presenting the ordinary symptoms of muco-purulent discharge, frontal headache, etc.

On examination, it was found that both inferior turbinated bones were well raised above the plane of the floor of the vestibule, and were intensely engorged both in front and behind. The nasal chamber was somewhat the smaller, the septum being moderately deflected to the left. Both the middle turbinated bones were engorged, and behind they were seen lying against the septum.

The treatment of this case presented some exceptional features. The patient being of an excessively nervous disposition would not permit the use of the galvano-cautery. Treatment was therefore entirely confined to repeated applications of glacial acetic acid, and of nitric acid to the nasal mucous membrane. This plan was pursued till April 15, 1883, when by reason of illness in his family he was compelled to return home and has not since been seen. A letter received in September, however, stated that he had for the first time in many years escaped his usual summer asthma.

In this case, the applications of the acids evidently accomplished the same results as would have been attained by the use of the galvano-cautery, namely, a reduction in the size of the membranes covering the turbinated bones, and possibly the destruction of hyperæsthetic surfaces.

CASE VI. A gentleman aged 23, of small frame, with black hair and eyes, of somewhat nervous disposition but of excellent constitution, reported for treatment October 17, 1882. He had suffered for sixteen years from hay-fever, two other members of his family, a cousin and a maternal aunt, being similarly affected. The patient had also suffered from a chronic nasal catarrh, the principal distress from which arose from occlusion of the nasal passages. His periodic attack would begin mildly on the 10th of August, becoming more severe on the 20th or 21st, and ending about October 10th, provided he remained in Philadelphia. While it continued, deep-seated itching would be felt in the mouth, throat, and respiratory tract, generally, sometimes followed by cough and considerable expectoration. Severe and constant conjunctivitis, with itching and puffing of the eyelids, was one of the most annoying symptoms. Exposure to light increased the distress in the eyes. The attack was always worse during moist, hot days, and in a furnace-heated room, than in the open air. Exposure to any heated dry atmosphere produced occlusion of the nasal passages, with an accompanying sense of suffocation. When so induced, this occlusion was immediately relieved on the patient's going into a cold room or into the open air. He was most comfortable in cool damp weather. A sense of fulness would sometimes be experienced in the lower part of the forehead during the attack, but most of the sensations were confined to the eyes and nose. There was no pain behind the ears, and no sensation as of a band drawn about the head. At no time of the year did wheezing, shortness of breath, or genuine spasmodic asthma appear. Mental influence seemed to be nil. Tobacco had no effect; hot coffee, used only occasionally, apparently modified the symptoms for the better. In the spring the symptoms, if present at all, were very slight, and lasted for a few days only, varying from the end of May to the end of June. The occurrence of the spring attack, however, has not modified the autumnal period either as to duration or severity. At any time of the year, an acute attack of coryza might be brought on by exposure to dust, or to irritating vapours, even by smelling carbolic acid crystals; though hay, flowers, etc. would have no particular effect. The patient seemed to be singularly free from liability to "take cold" from exposure to draughts,

wetting, etc. During an attack prompt relief was obtained by a sea voyage.

Upon examination it was found that the left nasal chamber was very small in all its proportions, and firmly occluded in the maxillary and palatal portions. The septum was not deviated. The inferior turbinated bone was raised above the plane of the floor of the vestibule. Posteriorly, at the plane of the posterior nares, a well-defined swelling was detected at the upper part of the vomer. The left posterior naris was smaller than the right. The right side was capacious throughout, though the posterior naris was nearly occluded by a hypertrophy. The pharynx was irritable and injected, and the salpingo-palatal folds unusually conspicuous.

Treatment began October 17, 1882, and was discontinued on the 2d of June, 1883, with the understanding that it was to be resumed at the beginning of the usual annual attack. This attack, however, was considerably modified in severity, and throughout the whole period the patient acknowledged considerable difficulty in reporting with the typical symptoms present. While he was satisfied that something still remained to be done for his relief, the parts were always found free from congestion, and both nasal chambers were usually open, which results could be directly attributed to the treatment of the previous winter. However, on the morning of August 22, two days after the time of the usual appearance of his attack, and after a dusty railroad ride of sixty miles, he reported with a moderate amount of turgescence of the mucous membranes, which partially occluded the left nasal chamber at the beginning of its palatal third. Accompanying this condition there existed also, to some extent, the characteristic itching of the eyes, the disposition to sneeze, the tingling in the nose, etc. The galvano-cautery was at once freely applied on the left side to the opposed surfaces of the inferior turbinated bone and to the septum at the beginning of the palatal third of the chamber. The patient almost immediately acknowledged relief from his disagreeable sensations; and on several other occasions, when he had felt the symptoms returning and had appeared for treatment, he reported decided temporary benefit from the use of the galvano-cautery. On the whole, as the result of the continued repetition of the cautery applications, the distress peculiar to "hay-cold" gradually lessened, and by September 25 he considered himself well, or, to use his own language, "comfortable after incomparably less suffering than in previous years. The cauterization during the attack was accompanied with no sense of discomfort, and I invariably left your office better than when I entered it."

REMARKS.—The conclusions to be drawn from the study of the foregoing cases can be summarized briefly as follows:—

(I) That the treatment of all conditions of obstruction in the nasal chambers, no matter from what cause arising, can be successfully carried out by destroying the causes of obstruction. If the cause be an overgrowth of bone-tissue, it must be filed, sawed, or drilled away (Case III.). If it be caused by a deviated cartilaginous portion of the septum, such portion must be re-set in a new place (Case IV.).[1] If, as is often the case, it is due to periodic turgescence of the mucous membrane or the resulting

[1] See author's paper in The Medical News, 1882, xli. 32.

secondary hypertrophies, such growths must be destroyed, either by the galvano-cautery, by the snare, or by caustic acids.

(II) That the treatment of hay-fever and allied periodically recurring nasal affections in no way differs from the treatment of other nasal diseases accompanied by obstruction, and that the treatment may be conducted during an attack as well as in the intervals between any two attacks.[1]

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## ARTICLE X.

### ELEPHANTIASIS ARABUM CURED BY LIGATURE OF THE FEMORAL ARTERY.

By G. C. E. WEBER, M.D., of Cleveland, O. (Reported by J. G. Gehring.)

IN view of the fact that the successful operations, both in this country and in Europe, for the cure of this most obstinate disease of the lower extremity, by ligation, are so few as to be easily counted upon one's finger ends, and because of the apparent propriety of resorting to this last method before amputation becomes an imperious necessity to save the life of the patient, I take the liberty of calling the attention of the profession to the following successful case operated upon by Dr. G. C. E. Weber, of Cleveland, O.

Elephantiasis Arabum, although very rare in this country, and seldom if ever occurring among native Americans, is occasionally met with in individuals of foreign birth, such a one being the case in question. Originally occurring in certain parts of the Orient, it has gradually found its way to western Europe, and is now not uncommon in the countries bordering the Atlantic seaboard. It is a disease that is oftenest found affecting people in the lower walks of life, who, by reason of poverty and privations, and perhaps as a result of debauchery and reckless living, are ill-fed and poorly nourished and their vitality reduced to a point so

[1] The study of the above subject-matter has extended over several years, and it will be seen that Case IV. is dated April, 1881. Desiring to mature my plan and not appear hasty in drawing my conclusions, I awaited extended experience before publishing my results. I desire in this connection to state that my friends Dr. Wm. H. Daly,[2] of Pittsburgh, and Dr. J. O. Roe,[3] of Rochester, New York, have published the favorable results of the treatment of hay-fever by surgical methods. Drs. Daly, Roe, and myself have been working in this matter independently of each other, and it is probable that other practitioners who have not yet published their results have also been laboring in the same field. It must in justice to Dr. Roe be said that in one respect he would not agree with my conclusions since he does not approve of the conduction of the treatment during an attack. In my own experience, the treatment not only may be undertaken at any time, but it is even preferable that it should be initiated during an attack, for the places of contact can be then easily determined.

[2] Archives of Laryngology, 1882, iii. 157.
[3] New York Med. Journ., 1883, xxxvii. 512.

low as to render themselves peculiarly liable to disease and their system a ready victim to the inroads of elephantiasis.

Ligation, with a few notable exceptions, has been rarely resorted to, due in part to an improper understanding of the nature of the affection, and in consequence of this its treatment, and possibly also to a reluctance on the part of the physician to endanger the life of his patient by mortification and death of the limb.

Dr. Carnochan of New York has become the pioneer in this direction, and conceived the idea that by mechanically shutting off the supply of blood to the affected limb, the intensely morbid proliferation of tissue might be checked. Acting upon this inference, his wonderful success with his case of January, 1851, and published in a memoir in 1858, proved a powerful argument in favour of the theory advanced, and served to cause other surgeons to follow and emulate his brilliant example. He was followed by Richard G. Butcher, of Dublin, in 1861, whose classical case of a woman 44 years of age, reported in his work upon "Operative and Conservative Surgery," serves as a beautiful exposition of the complete and marvellous cure brought about by this simple method!

Butcher was followed by Bryant of Guy's Hospital in 1865, who also met with striking success in his first case of a Welsh girl æt. 25; several subsequent operations, however, were not equally successful. Alcott, in 1866, also operated successfully. Aside from the above cases, however, few, if any instances are cited wherein this method of surgical interference was crowned with the hoped-for results.

It may perhaps be proper in this connection to state briefly the views of different authors upon the origin and nature of this disease. Wise of Calcutta, and others, look upon it as being essentially an inflammatory disease of the venous system; an obstruction of the veins of the affected part of some nature, would check circulation, and in this manner cause irritation and inflammation, followed by plastic exudation and subsequent organization of the same in the surrounding cellular tissues. Others, and perhaps a majority of the writers upon the subject, among whom may be mentioned Gross, Bardeleben, Koch, etc., are of the opinion that the disease results in consequence of a disturbance of the functions of the lymphatic vessels; the intimate connection between the lymphatics and the connective tissues would easily tend to make the latter a ready participant in any pathological conditions in which the former were involved. Any lesion of the lymphatics—and it is usually after ulcers or other interruptions of the continuity of the integument and underlying tissues has taken place, and that nearly always below rather than above the broken part, that the swelling and infiltration of the tissue begins—would tend to be the direct initial cause. With such an obstruction of the lymphatics there would ensue an inflammatory condition followed by a retention as well as an exudation of plastic organizable matter, causing obstruction and perhaps

complete obliteration of the calibre of the vessels. An organization of the plastic matter thus retained and checked in its normal flow would be the direct sequence, and this would resemble in its structure the cutaneous and cellular tissues of the surrounding parts. But as to whether such inflammation of the lymphatics is the direct or only a secondary cause of the disease, seems yet to be open to discussion.

The case in question was as follows:—

John D., a German 40 years of age, and a resident of this country for more than 25 years, came under the notice of Dr. Weber at the Cleveland City Hospital in the latter part of the winter of 1882–83. He came there for the purpose of having his left leg amputated at the advice of physicians, in consequence of an extensive hypertrophy of the integument and underlying tissues of his leg and ankle—a marked and typical case of elephantiasis Arabum, or "Jambe de Barbadoes" of the French. His family history as far as could be learned seems to have been good, his parents having both been healthy, save that the mother at one time had a varicose ulcer upon the leg. There were living two brothers and one sister of the patient, all in good health. The patient was a married man, and the father of three healthy children. His own health had been, until several years ago, quite good. At the time of his admission to the hospital, he had a small umbilical hernia that was causing him no inconvenience however, and was securely held in place by a pad.

The occupation of the patient was that of barkeeper, an employment that may have been no inconsiderable factor in bringing him into the condition of physical deterioration he then found himself. The clinical history of the case is as follows: about two years ago the patient met with an accident in which he fell from a wagon in such a manner as to bruise both legs; the left being denuded of a small portion of skin near the inner surface of the ankle. Shortly after this initial disturbance both legs began to enlarge from the ankle to the knee, attended by some discoloration and considerable pain. At the same time a profuse watery discharge began to exude from the denuded surface, which continued for some length of time. Then, without any apparent cause, the right leg began slowly to decrease in size, until it had again regained its normal proportions, save that the skin retained its darkened colour in consequence of pigmentary deposit. The left leg, the one with the abraded surface, near the ankle, now began to rapidly increase in bulk, the skin becoming greatly hypertrophied, rough, and swarthy with pigment. With this rapid increase in size the limb became cumbersome and unwieldy, causing the patient much embarrassment and inconvenience in following his occupation and being about. If on his feet for any length of time the circumference of the leg would increase three to four inches, this swelling again subsiding when in a horizontal position. The patient did not seem to complain of any very acute pain during this time, there being only a constant dull aching in the part, accelerated somewhat by prolonged exertion, and again relieved by quiet and rest. This condition of things was not a stationary one, however; slowly, but surely, the limb increased in size. Little by little the accumulation of organizable matter increased, one layer was added to another, the papillæ became raised and enlarged, the epidermis became proliferated so rapidly that its surface became rough and broken, until the condition of the patient became so alarming that amputation had been

advised by his friends and physicians, and he came to the hospital for that purpose.

At the time of his arrival, March 8, 1883, the leg measured 22 inches in circumference around the ankle, and 21 around the calf, with a general enlargement of the knee and thigh, diminishing toward the groin. The lower portion, as may be seen by examination of Fig. 1, from the ankle

Fig. 1.

to the middle of the calf, consisted of a decided papillomatous hypertrophy. The cauliflower-like corrugations were very marked, the papillæ being gigantic in size, rough and horny to the touch, dark with pigment, and divided by numerous fissures of varying depths from which a thin bloody fluid constantly oozed. By reference to the figure two large fissures may be seen which were about an inch in depth, one of which extended entirely around the leg just above the ankle, and the other partly around near the middle of the calf. These two great sinuses seemed to limit, above and below, the extensive papillomatous growth, making a very decided line of demarcation between the two surfaces. Immediately above the upper

fissure, the skin, although still greatly infiltrated with plastic organized material, was comparatively smoother.

At the inner side of the ankle, and just above the lower fissure, there was an ulcerous depression that was also continually discharging. The odour of the diseased limb was very characteristic, resembling that of the original secretions greatly intensified, and together with the appearance of the pachydermatous skin made the whole a most repellent object. Owing to prolonged dissipation the patient was, at this time, in a condition that precluded all possibilities of an immediate operation. His muscles were soft and flabby, the heart's action weak, and respiration laboured.

The pulsations of the femoral could be distinguished but with great difficulty, having a feeling as though situated at a profound depth beneath the surface.

The first steps to be taken were, of course, to bring the patient into a condition of better general health, in order to render the conditions for a successful operation more favourable. With this end in view he was at once put upon a preparatory course of treatment, consisting of the administration of iron and quinia, together with good doses of the tincture of digitalis repeated every six hours.

On March 16th he was considered in a fair condition for operation, although his heart's action was still quite feeble. Owing to this fact ether was administered with great care and very slowly, and it was nearly thirty minutes before anæsthesia supervened. This accomplished, an incision was made parallel to the course of the femoral, commencing three inches below Poupart's ligament, and continuing four inches downwards. With much difficulty the femoral was found, owing to its depth in the softened infiltrated tissues, and securely ligated at the point where the sheath of the vessels is crossed by the Sartorius muscle, at the apex of Scarpa's triangle. The edges of the wound were then carefully brought together by two silver-wire sutures, and additionally strengthened by transverse strips of adhesive plaster.

This accomplished, the limb was loosely encased from the toes to the groin by an ordinary flannel roller bandage, in order to give additional support to the tissues. The patient was then placed in bed, the limb slightly elevated to still further assist the flow of the returning fluids, a woolen blanket wrapped around and hot water bottles applied.

It was now necessary to keep the patient as quiet and comfortable as possible, which result one-quarter grain doses of morphia, administered hypodermically, brought satisfactorily about. From this time on the patient began to progress slowly but surely toward recovery; the tonic treatment of iron and quinia was kept up with marked benefit. His temperature, which in the beginning (after the operation), went as high as 102° F., gradually subsided, and his pulse, which vacillated between 80 and 104 in the first few days, regained its normal beat. His general condition began to improve visibly, and from a state of debility and general impoverishment, brought about by reckless living and aggravated by the intense morbid changes taking place in the diseased limb, he gained a new lease of life, and a tone and vigor, which, although far from that of robust health, he had, nevertheless, long been a stranger to. During this convalescence his leg rapidly decreased in size, and this was still farther visibly augmented by repeated applications of a solution of carbonate of soda (about 1 ℥ to 1 pint of water), used to soften the dry thickened epithelium which was then readily scraped off with a spatula. This came off in large

sheets and layers, sometimes a line in thickness, and of a sickening, sweetish, penetrating odour, not to be described. The deep fissures above alluded to ceased to discharge, and with the subsidence of the immensely hypertrophied integument and tissues between them, gradually became effaced. The wound at the ligature healed rapidly, with the exception that about one week after the operation an abscess was detected at a point a little below the position of the ligature, which upon being opened revealed a slough several inches in length, from which considerable pus was removed. After this no further difficulty was experienced, and the

Fig. 2.

process of healing went along very kindly. Between three and four weeks after the operation, the ligature permitted itself to be easily detached, and four days after this, or about thirty days after the operation, the patient was discharged from the hospital. The leg now measured eleven inches in circumference around the ankle, and thirteen inches around the calf, a difference of eleven and eight inches respectively between the present and former measurements. Fig. 2 represents the appearance of the limb at this time, although it will be observed that the proper proportions of the leg had not been fully restored, due, however, to the restrictions imposed by the bandage which had been kept constantly applied.

Upon his dismissal the patient departed for his home, and was lost sight of for some time. At the end of about six months a letter received from him reported his condition as being very satisfactory indeed, he being enabled to go about his occupation suffering no inconvenience whatever from his limb, save that upon unusual exertion a slight œdematous swelling would supervene.

In a subsequent letter he reiterates his favourable reports, speaking most thankfully of his improved condition and of the restoration of a limb, that himself, his friends, and physicians had for several years already despaired of.

For notes kindly furnished concerning the treatment of the patient while at the hospital, I am indebted to the courtesy of Dr. C. P. Linhart, of that institution.

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## ARTICLE XI.

### PAGET'S DISEASE OR MALIGNANT PAPILLARY DERMATITIS (THIN).[1]

By S. SHERWELL, M.D., of Brooklyn, New York.

THE number of cases so far reported, of this rare and interesting skin lesion, which was first brought to professional notice by Sir James Paget in 1874, is limited, and I have been able to find recorded only 27 cases, including the two herewith given. Of these cases Sir James Paget records 15,[2] Mr. Butlin 4,[3] Mr. Henry Morris 2,[4] Dr. George Thin 2,[5] Dr. Duhring 2,[6] and the author 2.

Paget, to my mind, gives the best description of the characteristics of this affection with which I have met, but he does not mention one peculiarity upon which Thin lays much stress, viz.: the papillary, soft warty epithelial projections, first occurring in and around the areola, and afterwards on the parts nearer the periphery.

[1] Abstract of paper read at meeting of American Dermatological Association, 1883.
[2] St. Bartholomew's Hospital Reports, 1874, vol. x. p. 87.
[3] Medico-Chirurgical Transactions, 1876–77, vol. lix. and lx.
[4] Ibid., December, 1879.
[5] British Medical Journal for May, 1881.
[6] American Journal of the Medical Sciences, July, 1883.

I will narrate the histories of the following cases which came under my own observation as concisely as possible.

CASE I.—Mrs. S., æt. 75, mother of several children, and in affluent circumstances, general health remarkably good, and family history unusual as to longevity and freedom from disease. About ten years ago she first noticed a weeping on and around nipple, due, as she imagined, to traumatism from the attempt at nursing a young child, her grandson. For a time the ordinary household remedies were resorted to without effect, and for some years thereafter she was treated by a number of physicians, regular and irregular, without result except perhaps an aggravation of the trouble; the diseased area, when left alone, as it had been for about three years before I saw her, slowly extending. The history and appearance of lesion was that of an ordinary chronic eczema, the discharges absolutely like that of the disease in question, and when I was called in on March 22, 1881, I unhesitatingly pronounced it to be such, and held out fair hopes of a good recovery. At that time there was no induration around the edges, and nothing but a soggy infiltration of the skin; in fact it presented no symptoms which in my mind served to distinguish it from an eczema, in a site that was exposed to attrition and irritation by clothing. The sunken or "melted away" appearance of the nipple was the only remarkable feature; there did not seem to be any true erosion or history of such at this part, and as certainly no true retraction. The axillary glands were either unaffected or else to a very slight degree at this time, but became markedly so, at a later stage; nothing deserving the name of pain in the breast was complained of, but occasionally a "burning," and sometimes extreme pruritus over the affected surface was noticed—the subjective symptoms, in short, of a severe chronic eczema. The lesion was extensive when I first saw it, occupying the major portion of the skin over the right breast, about five to six inches, certainly involving all the mamma on that side. In and around the areola were some of those heaped-up sodden epithelial projections which have caused Thin to give it the name he does.

Believing I had an eczema to deal with, I treated it as such, using soothing and gently alterative efforts as a general indication; and for a time, as it seemed, with some effect; for a degree of attempt at repair was manifest, and the subjective symptoms were certainly lessened. This went on for some months, till at the end of June, 1881, I left for Europe, leaving her in the care of my clinical assistant. While attending the meeting of the Skin Section of the International Medical Congress of 1881, I saw some cases of this disease which were presented, I think by Dr. Morris, and I recognized this one as belonging to that type. When I returned I found it had not improved under treatment, and from that time held out to the family a very poor prognosis. On re-examination I found all the objective symptoms worse, the warty growths had commenced in other more distant parts, the axillary glands could now be felt distinctly, the burning sensations had become rather, as she said, smarting, the itching, and catarrhal discharge of the surface worse; still none of the lancinating pains so common in ordinary malignant affections of the breast were present. Palliative and anodyne applications were the only remedies used from this time, and they with only moderate benefit. The best covering for the breast seemed to be a thickness or two of waxed white paper. The symptoms grew worse from this time, and by degrees the healthy derma was invaded until the whole of the anterior half of the thorax became affected; nevertheless the general health kept fair. She died March,

1883, from an attack of diarrhœa and peritonitis, due in no way, as I believe, to the trouble in question, but idiopathic in character. No operation was asked for or advised by myself at any time; no autopsy. About the commencement of October, 1882, Dr. L. D. Bulkeley saw her in consultation, and he unhesitatingly confirmed my diagnosis; and recommended some palliative and antipruritic lotion, which she used for a little while, when it was cast aside as useless, as all other remedies had been before.

CASE II.—Rose M., æt. 49, married, childless, excellent family history, she presenting all the evidences of good health, came to my clinic in January, 1883, to show me her right breast, on the centre of which had been present for nearly three years a weeping, itching, and occasionally burning patch, in size about 2 inches by 3 inches, which had caused her great inconvenience, and for which she asked relief. The history of gradual commencement and extension from nipple, and the appearance were so marked and similar to the preceding case, that it would only be a recapitulation to give it in full; suffice it to say that Sir James Paget's description covers it exactly.

I told her that an operative procedure would be necessary for her relief, and strongly advised ablation of the breast on that side, to which she would not consent, but begged me to try and heal it by other means. I assented for the sake of gaining time, and as inducement for her to show herself at the New York Dermatological Society, which she did later. (See *Journal of Cutaneous and Venereal Diseases*, March, 1883.) Almost all the members present on that occasion advised ablation of the mamma; but this being objected to by the woman, a variety of escharotics were suggested; I selected the acid nitrate of mercury, but for other reasons than its powerful caustic action.

It was not until March 13, 1883, that she consented to an operation, which I did in the following manner: Having built up a dam by superimposed strips of Mead's surgical plaster, around and well outside of the periphery of the affected portion of skin, the patient lying as flat on her back as possible, and covering this plaster over with repeated applications of collodion, I almost poured on the escharotic till it formed a pool on the site of the "melted away" nipple, supplementing this also with superficial stabbing with an exploring needle. This caused extreme pain, which was well borne, the patient having refused an anæsthetic. After having allowed the escharotic full time for working, the surface was dried, and dressed in the usual manner, and she made an ordinarily fair recovery. One accident only supervened, and that an almost wished-for one: at the end of the third day a profound ptyalism set in, which lasted more than a week. I had selected the acid nitrate of mercury with the hope that it might have such an alterative effect on the epithelium of the lactiferous ducts and acini by absorption as would be beneficial to the patient.

I tried to keep her under observation, but after the healing of the sore she seldom appeared at my clinic. At the time of her last visit, about a month ago, I noticed that while all the rest of the surface cauterized looked like ordinary scar tissue, there was still at the site of the nipple and immediately around it what appeared as if the old process was recommencing or still going on. The mamma under the parts treated has now a feeling of superficial induration, but I am not clear as to whether or not that may not be attributable to the hardened cicatricial tissue above. I still urge amputation of the breast, which she as steadfastly refuses. The only application made use of now is a little ung. aq. rosæ.

In conclusion, I will summarize what appear to me to be the diagnostic evidences of this disease :—

1. The subjective symptoms, itching, burning, etc., are those of an eczema, and not those of an ordinary carcinomatous affection, but they are more marked than in an ordinary case of eczema.

2. The objective appearances are like eczema; the discharge is absolutely similar to that of eczema; it stiffens linen, and forms crusts entirely undistinguishable from those of an impetiginous eczema. The colour of the surface is, perhaps, occasionally more livid, but the border is, in my opinion, not more sharply defined than is common in that trouble; the somewhat elevated appearance of the patch simulates exactly the acutely macerated and swollen conditions of the lower epithelial layers we so frequently find in eczemas. Sir James Paget compares the appearance to that of balanitis, an excellently apt illustration.

3. The disappearance of the nipple is spoken of by Henry Morris as a "melting away." I have used the term two or three times, as it seems the best to describe its gradual obliteration; certainly nothing like rapid ulceration takes place in typical cases, scarcely what could be dignified by the name of erosion. It disappears.

4. The retraction of the nipple or tissues immediately beneath, if retraction there be, is not to be distinguished as such, as is so easy in ordinary cancer.

5. The "malignant papillary" feature, as described by Thin, was a marked element of my first case, but much less so in the second. It is a very diagnostic point, and would of itself, I think, instantly resolve any doubts as between Paget's disease and a true eczema.

6. The extreme length of time may be noted in my cases before the appearance of anything like positive evidence of carcinoma. It will be noticed that Sir James Paget gives the limit as to this as two years. In my first case twelve years elapsed from the beginning of the attack to death, the latter event not seeming in any way connected with the skin lesion. In the second case considerably over the time mentioned by him has passed.

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## ARTICLE XII.

### CASE OF FRACTURE THROUGH THE ANATOMICAL NECK OF THE HUMERUS, WITH COMPLETE SEPARATION AND DISLOCATION OF THE HEAD OF THE BONE INTO THE AXILLA, WITH ITS SUBSEQUENT REMOVAL.

By THOMAS G. MORTON, M.D., Surgeon to the Pennsylvania Hospital.

JOSEPH W., aged 73, was brought to the hospital Nov. 22, 1882, with the history that while intoxicated he had fallen down stairs, but how he had struck was not known.

An examination showed discoloration and some swelling of the left shoulder, with preternatural mobility of the joint, but crepitation was not marked, a fracture through the anatomical neck of the humerus was readily recognized, the head of the bone was completely separated, dislocated, and driven into the axilla, where it formed a distinct tumor, which could be grasped by the hand, turned completely round, and its location easily changed. The question of permitting this portion of bone to remain in its unnatural position, or its reduction or removal by incision, was then considered. It seemed reasonable to infer that the head of the bone so entirely deprived of all source of nourishment, even if reduced would probably perish. Yet in the absence of evidence showing that the head of a bone so detached ever became a sequestrum, and the fact that even as complete fractures with separation and irregular apposition had been followed in many cases by more or less union, it was agreed, in consultation with my colleague, Dr. Agnew, that an attempt should be made to effect reduction.

After a number of vigorous efforts had been made without success, and having determined not to leave the head of the bone in the axilla, its removal was decided upon, and readily accomplished by a small incision at the lowest part of the axillary region.

The wound was brought together by silver sutures, and the arm was bound to the chest.

The patient was in a condition to leave the hospital on December 5th, but on the following day he was attacked with a severe diarrhœa, with great exhaustion, which terminated fatally a week later.

The line of fracture in the specimen removed was directly across the anatomical neck, where some capsular tissue remained attached.

The humerus subsequently obtained showed considerable absorption, and rounding off at the seat of fracture, but the joint was otherwise uninjured.

# REVIEWS.

ART. XIII.—*Hospital Construction and Management.*

1. *Hospitals, Infirmaries, and Dispensaries: their Construction and Management.* By F. OPPERT, M.D., M.R.C.P.L. Second (English) Edition, revised and enlarged. 8vo. pp. xviii., 278. London: J. & A. Churchill, 1883.
2. *Hand-Book for Hospitals.* Issued by State Charities Aid Association. 12mo. pp. 263. New York: G. P. Putnam's Sons, 1883.
3. *The Relative Mortality after Amputations of Large and Small Hospitals, and the Influence of the Antiseptic (Listerian) System upon such Mortality.* By HENRY C. BURDETT, Fellow of the Statistical Society; Late Secretary and General Superintendent of the Seamen's Hospital, Greenwich; the Queen's Hospital, Birmingham, etc. etc. 8vo. pp. 41. London: J. & A. Churchill, 1882.

THE student of the history of hospitals and their construction must be struck by the remarkable fact, that medical men have had so little to do with planning and governing them. From the time when the control of European hospitals by ecclesiastics led to such abuses that in the 14th century they were put into the hands of laymen, in order that the sick might be better treated, and the Pope ordered in Italy that no physician should attend the same case twice without calling in a priest to watch over the safety of the soul of the sick person, until too recent times, the relation of the physician to the sick in hospitals has been embarrassed by an unaccountable prejudice on the part of their governors. A history of hospitals is too much one of perverse and uniform disregard of the correct principles which should guide their location, construction, and management.

These principles, as at present understood, were first treated with scientific accuracy by M. Tenon, a French surgeon, who, nearly a hundred years ago, pointed out the causes of the dreadful condition of the old Hôtel-Dieu, and laid the foundations of the pavilion system now being adopted. But the first building of the kind, the Hospital Lariboisière, was not completed till seventy years later, and this, with the new Hôtel-Dieu begun twelve years later still, in 1866, are costly failures. In utter disregard of the experience of a century, and the conclusions of the Surgical Society of Paris, and other weighty medical authorities, the Hôtel-Dieu was not only located in Paris, but the correct principles of construction were so distorted and misapplied, as to make it one of the unhealthiest of hospitals. It is lamentable enough that competent authorities should have so misapplied correct principles as to have made another costly failure in the new St. Thomas Hospital, completed so recently as 1871, but it remains true that the best hospitals and their good management must be expected to come from medical men, for they only best understand what is required.

The great wars of the last thirty years have marked an epoch of development of the modern system of hospital construction in each of the great countries of the world. In England, attention was aroused by the disasters at Scutari in 1854–5, and later Miss Nightingale's *Notes on Hospitals*, that cannot be overvalued, sustained by the reports of the Army Sanitary Commission, led to a reform; but the fault in the Crimea was entirely due to military mal-administration, and not to the medical department of the army, which had no effective control over its own affairs. Dr. Parkes then observed in Turkey an example of the value of one-storied wooden buildings connected by an open corridor, for the purpose of getting patients into the air.

The Prussian, Austrian, and Franco-German wars all taught instructive lessons, but to America, during the war of the rebellion, belongs the honour of having most largely and authoritatively developed some of the most essential principles of the new system of hospital construction, through a readiness to seize upon the best practical adaptation of means to ends. As soon as the earlier difficulties had shown the inadequacy of preconceived ideas, the medical department of the army was put into efficient control of all medical and sanitary matters. The principle was pushed to the logical result of recognizing general hospitals as military posts, and making the surgeons in charge their commanding officers, to whom the line officers attached to the hospital were subordinate. Such were the results that there could thereafter be no question that competency in such affairs belongs to medical men, and that their added professional knowledge of the requirements of the sick makes them most competent to direct the construction and management of hospitals. The authority of army medical officers, as sanitary inspectors, ceased at the close of the war, but was restored in 1874, and the final action on their recommendations was removed to a higher authority than that of the immediate superior. To Dr. Letterman, who was made Medical Director of the Army of the Potomac in the second year of the war, is due, more than to any other man, the credit of originating a system of medical administration unparalleled in simplicity, efficiency, and the magnitude of its operations. By his sagacity and success, he broke through the customs of service and military discipline, and opened the way for medical men to show that they were like other men in their capacity for administration.

To the lessons of the war is due the successful and growing influence of medical men in directing the construction and management of civil hospitals. Opposition to reform is apt to be inconsistent, and in this matter it has been, and unfortunately still is, most difficult to dislodge error grounded in tradition and prejudice. England gives a notable example of this in the slowness to adopt rational views in the management of her military and naval medical service, and in her civil hospitals, while the success of their adoption in the care of the insane is not excelled by any country.

During the last thirty years many new hospitals have been built, embodying correct principles with varying degrees of success or failure. While more permanency of construction has been employed than was advocated by some of the best authorities fifteen years ago, the tendency is to the simplification of the pavilions to those of one or two stories, and their more complete separation from each other; either without connecting corridors, or with only open ones.

In Germany the works of Dr. Esse marked an advance in the applica-

tion of the pavilion system, and it was fully carried out in the Berlin Hospital, completed in 1874, consisting of pavilions of one or two stories, entirely separated from each other, also about the same time in the Heidelberg Hospital. Germany is much in advance of France and more so of England in this matter. But in France has been recently introduced the most original and perhaps most important of modern modifications of the pavilion system, that of M. Tollet. This system is one of single-storied pavilions, built upon the plan of the Gothic arch to avoid stagnation of air, connected by open galleries, and warmed and ventilated without expensive mechanical appliances. The new army and navy hospital at Hot Springs, Arkansas, is to have two pavilions built upon this plan.

During the last ten years great advances have been made, particularly in England and this country, in the arrangements of sanitary appliances, for the removal of excreta, and the ventilation of drains and sewers.

The literature relating to hospital construction, and the sanitary questions pertaining thereto, have grown to be voluminous, and in examining the works now under review some special subjects will be noticed.

1. There have been three German editions of this work of Dr. Oppert's, besides this second English edition preceded by a first one in 1867, when it was said to be the first English work comprising a complete treatise on its subject. Part I. in eighty-five pages, or less than one-third of the book, treats briefly of construction and administration, and of special hospitals, with a few pages on workhouse infirmaries, dispensaries, and relief of the poor in their homes. There appears to have been little revision of this part of the book, for it reads as if written nearly twenty years ago, and is disappointing if one seeks for definite information on certain important points. The general statement of principles as to dimensions, site, plan, etc., is correct enough, but so brief as to lack completeness and clearness in some respects as to the author's opinions, and the few specific directions as to minor details of construction leave much unsaid that would be looked for in a complete treatise. For example, the essential features of the pavilion principle are stated, but there is a doubtful expression of opinion as to the most important requirement that they should never be more than two stories high and as to their connection by corridors. But as early as 1864 were issued the conclusions of the Surgical Society of Paris, that express the views still held by the most advanced reformers, declaring on this point that "the superposition of stories should be limited to two," and that buildings "should be completely isolated;" and as late as 1883, Dr. Oppert might have been expected to revise his reference to the Hospital Lariboisière. Instead of mentioning it as one of the principal representatives of the pavilion plan, of the merits of which further experience would have to decide, because the "expectations founded on theoretical deductions" had "not been quite realized" in that hospital, he might have stated the instructive and now generally accepted conclusion, that it is one of the illustrious examples of failure to properly apply correct principles in many particulars, viz.: as to height of pavilions, being three-storied, their nearness to each other, the internal sanitary arrangements, etc. An exceptionally full description of this hospital is given in the second part of the book, but it misses a condemnation of its real defects. The new Hôtel-Dieu is disposed of in half a page with no comment upon the important and instructive fact that it has grave defects due to well-recognized causes. This hospital, completed in 1876,

is mentioned in one place in the book as now in the course of construction.

The chapter on water-closets sounds strangely enough to an American reader. They are said to be in general use in England, in contrast with the common use of latrines on the Continent, and are approved by the author, "as there are no better means of banishing disagreeable smells from hospitals;" and it is said "the best means of ventilating them are self-acting windows;" and, as "the closets must have the windows open," because "there is no better prevention for bad smells than a low temperature," there is difficulty in protecting the water-pipes from the frost. There is no further word upon what has been learned in the last twenty years in regard to the construction and ventilation of these appliances. This chapter should have been revised to make it consistent with the descriptions of hospitals in the second part of the book.

The subject of warming is treated more at length, the German stove and the French calorifère are described, and a brief reference is made to the hot-water system, which is said to be the best. Little account is made of heating by indirect radiation, although its use is briefly noted in several instances in the descriptions of hospitals. In regard to steam heating, it is said, "we find hospital wards and corridors rarely heated by steam circulating in pipes, because this has been found dangerous on account of danger of explosions," etc. This method, being practically in universal use in this country, it will be inferred, of course, that this statement is based upon observations in European hospitals.

In regard to the size and shape of wards, arrangement of windows, etc., the now commonly accepted views are well stated. The subject of ventilation is treated with comparative fulness, and with a sufficiently precise statement of general principles, as to the amount of air-supply required, the reasons for it, and the means of testing it; but there is the briefest and most unsatisfactory allusion to the methods of heating the air, the size and location of inlets and outlets, and to the need of using a fan as "the only efficient means of forcing in air in the summer."

In relation to the government of charitable institutions, the author regards the system of centralization in Paris as having great advantages, but as not necessarily suitable everywhere, and he criticizes, no doubt with justice, the management of the hospitals of London by private corporations as sometimes discriminating against the admission of the most needy and suffering poor, an evil which governmental control might remedy.

As to "who should be at the head of a hospital," the author gives no uncertain sound, saying, "if there is one man at the head, it seems very natural that he should be a medical man," and after stating the well-understood reasons for this, he says, that "on the other hand, it is contended that medical men in general are bad business or administrative men;" whereas "in some German hospitals, and in many French provincial and Irish charities, a head sister reigns supreme, and in Italy a monk sometimes acts as director."

In the chapter on nursing the author does not represent the progress that had been made at the date of this edition of his book. The various kinds of special hospitals are discussed in ten pages in a general way. A seeker for information concerning lunatic asylums would need to consult special works on that subject.

A general view is given of the condition of lying-in hospitals, and the terrible mortality in them up to the date of 1866, with the conclusions

published in that year by the Surgical Society of Paris, but no allusion is made to the equally authoritative and valuable conclusions of the Society of Public Medicine in Paris in 1882. Small buildings are advocated, and a plan is suggested for a hospital of forty beds in small wards and rooms, but with water-closets badly placed and the ward for puerperal fever in the same small building with the wash-house, and the objectionable suggestion that two blocks may be omitted by building another one higher. No reference is made to late progress in this matter, and there is no notice in the book of the application of the Tollet system to a maternity isolation pavilion at the Hospital Lariboisière. There is no mention in the book of the Maternity Hospital in Paris (except in regard to the training of midwives), with its long history of unhealthiness, nor of Dr. Tarnier's successful work there in the last decade, nor of the noteworthy success of the Pavilion Tarnier, a small building of two stories, with entrance to each only from the outer air, and with walls, floors, and ceilings made non-absorbent. No reference is made to the remarkable results obtained from investigations of this question as relating to the English work-houses in 1867, and later years, showing immunity from disaster to puerperal women in the lying-in wards equal to that in the country at large, and proving that women may be confined in public institutions without undue risk. After a brief description of the organization of public dispensaries the first part of the book closes with a notice of the methods of administering relief to the sick poor, at their homes, in different countries.

The second part of the book is said, in the preface, to "contain many additional descriptions and also new illustrations of hospitals recently constructed." It is made up of brief descriptions of a large number of hospitals, more than two hundred, in nearly all parts of the world, with seventy illustrations, most of them being outline plans of the whole or parts of hospitals, occupying, in many instances, a full page of the book. The descriptions are necessarily brief, but are concise, and point out the peculiar features of each hospital. The lists, etc., of hospitals of some countries seem to be quite complete; of others, partial, meagre, erroneous, and much out of date. For example, American hospitals are disposed of in seven pages. "The splendid Johns Hopkins Hospital" is referred to in seven lines, which is well enough, as it is unfinished, but in saying "an administration block is connected by covered ways with the other buildings," a wrong impression is conveyed as to the degree of their practical separation by an ingenious device permitting entrance from the outer air, even to upper wards of the two-storied pavilions. The Massachusetts General Hospital, which has some modern features that are unexcelled, is not mentioned. The Boston City Hospital is described in less than one page, with no notice of its being entirely remodelled and extended subsequent to 1875; while another paragraph and a half-page plan is devoted to the "Boston Free Hospital," an unadopted original name and plan for the first-mentioned institution. The book is interesting and valuable chiefly for its historical character, and for the information it gives of old and well-known hospitals, as showing what is to be avoided in the construction of new ones. It would have been interesting if the date of the building of each one had been given in all cases instead of a few, and valuable as marking the progress of improvement in construction. It is apparent, however, that England has been slower than others of the leading countries in adopting fully the principles of the pavilion system, as there are still being built there the

costly three-storied and even double pavilions, connected by closed corridors, a point in which countries less favoured in regard to climate have done better. The author seems really not to have accepted or appreciated the importance of the more advanced views, and fails sometimes to notice the presence or absence of essential features of the pavilion system in some of the most noted examples of modern hospital construction which he describes. Two noted French hospitals have been already mentioned as not having the causes of their defects pointed out, and, on the other hand, no mention is made of the Tollet system, novel and valuable as it is thought to be, tested by its application to barracks and schools, and its successful use since 1879 in a military hospital of twelve pavilions, which is only briefly noticed in this book in these words: "There is a new military hospital at Bourges, Paris, which possesses one-storied pavilions." A similar failure is made to call attention to the contrast between the prevailing English method and the excellent features of another and newer example of the Tollet system in the Montpelier Hospital, and the same is true in regard to the new Berlin and other German Hospitals, as to their being only one- or two-storied. It is further to be noticed that extreme brevity of description in many instances reduces the enumeration of minor appliances to mere catalogues, without conveying an idea of their construction, and for the same reason, in many cases, no definite information can be extracted upon so important a matter as the methods of heating and ventilation.

This book is not of the nature of a manual, and to one who has only moderate knowledge of hospital work and construction, it would be of much less value than to one familiar with such work, who could find in the book valuable hints and general information not to be found elsewhere, and who would understand by brief mention much that is unexpressed. The plan of the book is an excellent one, and while it is to be regretted that it was not more expanded and modernized in the last edition, it is still a useful book, and should be in every hospital library, and would be of value to any one interested in the subject.

2. This is a second edition of a manual "prepared in 1877, for the use of those members of the State Charities Aid Association, whose duty it is to visit public hospitals in New York County and other counties of the State." The work having been "carefully revised and enlarged, is offered to the public, and especially to all persons concerned in hospital work, with the hope that it may prove helpful and suggestive." It is an excellent book, and as such a manual should be, is convenient in size, well printed, and though it has only 260 pages, including appendix, they are well filled with information, useful because it is precise, and tersely and instructively expressed. It serves another excellent purpose not mentioned in the introduction, and has been practically used as a manual for the instruction of nurses in training schools on subjects treated in some of its chapters.

In the chapters of "general suggestions" and on the "hospital building," the correct principles of construction are well and fully stated with much detail. What makes a hospital healthy and unhealthy, and particularly the section on hospital infection, including a quotation from Mr. John Simon, is a condensation of much in little. It is declared that "the approved plan requires one-story wards, the ground beneath being coated with asphalt or other smooth dry surface;" that "there must be nothing within the four walls except the patients, their beds, tables, and chairs; the water-

closets and service-rooms, the drainage pipes, and whatever is necessary to make each such ward almost an independent hospital, being built outside of it." Two-story pavilions should have their wards separately ventilated. Connecting corridors when the climate requires them, are either entirely open or are well aired by side sashes, and never lead directly to the ward, but into the annex or service building.

It is well that for cold climates an exception is made to the extreme statements that the building should be "raised on piers or arches that the air may circulate freely, and be built with a view to being torn down if after a few years they prove infected; and that the roofs should be preferably ridge-ventilated, and the ceilings finished on the rafters, not plastered." Comfort and economy rightly demand consideration in the colder climates, and the best authorities are disposed to accept the later view that more permanent buildings may do as well as the temporary ones that did so good service during the late war. The basement spaces may be closed by substantial walls, in which, however, there may be abundant windows that can be open in summer. Hollow walls of brick plastered on the inside, and properly finished ceilings, subserve comfort and economy in regard to cost of reconstruction as well as of heating in winter. The scraping off and renewing of plastering every ten or fifteen years are more likely to be done than the tearing down and rebuilding of a pavilion ward, even though its cheap construction may have rendered it uncomfortable to live in and expensive to properly warm. The main defect of the Boston City Hospital one-story wooden pavilions, covered with corrugated iron, is that they are sometimes uncomfortable in extreme cold and windy weather in winter, even though they have an extraordinary supply of heat by indirect radiation, by steam apparatus capable of furnishing in winter weather an average of 8000 cubic feet of air per head per hour.

Square wards with fireplaces, air-shafts, etc., in the centre, are admitted to have a pleasant aspect, but they should not be more than thirty feet square. It is well said that small wards, of two to six beds, are objectionable in working a large hospital, as increasing labour and cost. A few such rooms are useful, but as a rule a ward should be twenty-eight to thirty feet wide, two to four times as long, and fourteen or fifteen feet high, with opposite windows, one for every two beds in medical wards, and one for every bed in surgical wards. Eight and ten feet of wall space per bed is said to be necessary, but a minimum of seven feet is accepted by some authorities as sufficient for large and well-arranged and well-ventilated wards, giving about one hundred feet of floor area, and about fifteen hundred cubic feet of air-space. Larger air-space by increased height is of no advantage. Surgical wards may well have more space for each patient. Tents for summer, and isolating huts are properly commended; but mention is omitted of the excellent isolating wards, with single rooms, of the Massachusetts General Hospital, and the perfected plans for similar buildings at the Johns Hopkins Hospital.

The management of the air-supply, heating, and ventilation are treated with sufficiently precise directions as to various methods, the effect of different locations of inlets and outlets, their size, etc. Open fires are considered most desirable, but, as requiring to be supplemented by indirect radiation.

The chapter on drainage and water-supply, including the arrangement of water-closets, lavatories, soil-pipes, and all such appliances, with reference also to the simpler conditions of a country hospital, is an admirable

condensation of the latest knowledge on these points, and there is little of importance to which attention is not called. The management of the hospital laundry is treated with the careful attention to all its details that its importance deserves, including the care of clothing from their use in the wards, through all the necessary processes, until returned there, and the proper disposition of articles requiring disinfection or destruction; and the duties of all persons concerned are clearly and instructively detailed. The management of hospital housekeeping, a most important matter, covering details of control and discipline of employés and all included under the duties of matron, is set forth understandingly and well. The gospel of cleanliness is preached with much power of exhortation.

One of the most important chapters of the book is that on the nursing service. It is a manual of nursing in itself, with its exhaustive enumeration of all that pertains to good nursing. The graphic description given of the order of duties for a day in a well-managed ward is pleasing and instructive. Promptness, discipline, cleanliness, good order, patience, and gentleness are the cardinal virtues in this matter, and to these may be added vigilance and *unexpectedness* of inspections. A head nurse, or superintendent of the training-school, is the proper responsible head of this service, and it is wisely recommended that to her shall be subordinate the matron as head of the housekeeping department, or if this is not the case, as in some hospitals, each should report to, and take their instructions from, whoever is their immediate superior. In small hospitals, the two offices may be combined in a competent person. Some good things are said in relation to the care of the insane, and the evils of poor-house management are referred to. Authorities do not agree however to some of the statements here made, for example that there should be no inclosed airing courts, for large inclosed gardens are a source of comfort and a sense of freedom to many persons who might otherwise have to feel that they are constantly and personally watched. The subjects of maternity wards and village hospitals are briefly but effectively treated, and the chapter on disinfection is admirable, relating to clothing, beds, wards, and all their appurtenances, and to the removal of sewage. After some valuable concluding remarks, an appendix contains specific directions for constructing an isolating cottage prepared by Dr. Wylie; a list of articles required for an outfit of a twenty-bed ward; a series of hospital rules and regulations that have been in practical and successful use; the instructions for disinfection, issued by the National Board of Health; and other matters.

The plan of the book is peculiar. By a little change of terms it would be most fittingly addressed to hospital officers instead of visitors. In its comprehensive treatment of all matters pertaining to hospital management, in its well-defined statement of the duties of subordinate officers, as well as of nurses and other persons it is a valuable manual for any superintendent, of whose important functions, however, little is said in the book, although his field of responsibilities covers all that is written in it. A few paragraphs in the last pages (except what is said of medical superintendence of the insane) state in general terms the importance of good superintendence and the proper division and grading of responsibility, but one who has had practical experience in such an office, and knowledge of its cares and difficulties, must be struck by an apparent defect in this otherwise excellent book that might be productive of error and trouble through interference of authority. It reads as if written from *outside* of a hospital, but by one who has had practical experience *in* such an institution. Hos-

pital government is essentially patriarchal in its character; its head should be, in its fullest and best sense, the head of the household or family. The more perfectly this principle of government is carried out, the better the superintendent is proved to be. All that conflicts with this is obstructive, and it is the first duty of inspectors to remember that they are to aid him. This book was written for official hospital visitors in New York, and "women visitors are chiefly addressed." It is claimed that woman's sphere should be greatly enlarged by furnishing a "field for the exercise of her organizing skill and intelligence, not only as visitors, but as managers and officers," and members of higher boards of supervision of charitable institutions. All this may readily be granted, but it is too much to say, that "it has come to be recognized that the specific duties of nursing are only properly performed when this branch of hospital service is under the direction of a committee of women;" and not wise to say, that "all the domestic affairs, as well as the nursing, might very wisely be placed under the control of women, two or three of whom could be added to any existing board of commissioners or managers for this purpose, with the title of House Committee." The whole subject of planning and erecting new hospitals and altering old ones is discussed, as a matter belonging to visitors and committees, with no reference to the superintendent; and in one of the three instances in the first half of the book in which this officer is casually mentioned, it is said, in regard to the difficulties of heating and ventilation, that they will be much simplified "if the superintendent is intelligent enough." There is much in the tenor of the book that implies direct responsibility of subordinate officers to visitors and managers and the propriety of their direct control. It is not enough even to avoid implying this. The condemnation of it should have been positive. A good superintendent would only welcome the intelligent inspections and helpful advice of women, as official visitors, and as members of a board of management, but he would righteously pray to be delivered from the woes that spring from any interference with household government, either by women or men. All honour to those who did the pioneer work of introducing reforms and good nursing into poorly managed hospitals, the women and men, *including physicians*, who have nobly engaged in it. The work of reform will not be completed till all is done that can be, to promote the unity, as well as to improve the quality of hospital government, for this begets harmony and removes friction.

Training schools and the nursing service of hospitals are being successfully carried on entirely under the management of the hospital authorities, which greatly simplifies matters. Under this plan the skilled services of trained women can be had for the efficient management of all departments that can be placed under their charge. A medical superintendent, better than any other, would appreciate the quality and value of such services. But while both methods may continue to be successful, and each may have its special advantages, the earlier and separately incorporated schools should not rest upon their own successes, but should lend their influence to carrying on the work in the interest of good hospitals, to the perfecting of the superintendence, with which they should strive to harmonize as a first law of good government.

In the earlier stages of the reform there was a natural antagonism between the schools and the authorities of some hospitals, and there is danger that the momentum of success may carry the former into fixed habits of antagonism on questions of authority that will obstruct or limit

progress. It may even now be said that the graduates of certain training schools can be distinguished by a characteristic want of appreciation of the regard due the authority of the superintending head of a hospital. Perhaps this evil and many others would be cured if the character of the superintendencies could be elevated. Every hospital of any importance should have a medical superintendent, an office from which a woman physician should not be debarred, who, if well chosen, could harmonize difficulties better than a layman. To such a superintendent an incorporated school should readily yield all points of authority needful to the attainment of the greatest good, even, if need be, to the abdication of the outside school organization, its special missionary work having been accomplished.

If clerks, grocers, machinists, sea captains, and city politicians can be thought to have fitness for hospital superintendencies, certainly other men may have at least equal administrative capacity, even plus a medical education. According to the bias of a board of managers, the buying of supplies, the care of the steam apparatus, or quarter-deck discipline, etc., may be deemed the most important requirement, whereas these matters of subordinate departments need to be harmonized and suited to the one main purpose of curing the sick, and this can be done best by a medical superintendent. The office should be dignified with all the professional duty possible, not including the treatment of the sick, and if one medical man fails another should be tried, for it is pitiful to see a retrograde movement in this slow-moving reform of hospital construction and management. It would be interesting to know how the great influence of the independent nursing-schools is being exercised on this point.

On one of the last pages of this book it is said, of what makes a good hospital, "the factors are, clean air, clean water, plenty of clean bedding and clothing, well-cooked food, enlightened medical care, trained nursing, and a pure and cheerful moral atmosphere; above all, and including all, skilled, honest, intelligent, humane superintendence." This is admirable, and makes amends for much in the preceding pages left undone that ought to have been done in a work animated by so high a purpose as this, but there remains the one defect of this excellent book, for the opportunity was neglected of giving potent aid by pronounced declarations in favour of medical superintendencies and unity of management, which the progress of hospital reform is obviously tending to establish. On the whole, it is to be said that this useful book marks the decided progress of recent years in the cause which it supports.

3. In Mr. Burdett's first edition of his work on Cottage Hospitals, in 1877, he published some statistics of the results of amputation in sixty-one of them, having an aggregate capacity of 553 beds, showing a mortality of 17 per cent. in 326 cases. These results were applied to sustain the well-known views of Sir James Y. Simpson and Prof. Erichsen on this subject. The former found an average mortality in town hospitals of 41.6 per cent. previous to 1868, while in a period of thirty-eight years prior to about the same date, Mr. Erichsen found a mortality of only 25.7 per cent. from all amputations performed in the University College Hospital. As a contribution to the heated controversy on the question of the inherent unhealthiness of large hospitals, described as "hospitalism," Mr. Burdett gives, in this book of forty-one pages, the result of a long and painstaking analysis, as shown in his tables of 241 cases of amputation

in cottage hospitals, showing a mortality of 18.6 per cent., a result of 7 per cent. in their favour. It is not the present purpose to follow the discussions of this question, as to the many differences between town and country, large and small hospitals, relating to the condition of the patients, and their surroundings and even to the operators themselves, that have greatly complicated the subject. The matter has been complicated still more by the inferences drawn from the use of Lister's antiseptic system leading the writer to declare "that where this method of treatment is carefully enforced, the size and condition of the hospital buildings are of comparative unimportance." This is based on the statistics of Schede, of Hamburg, who is said to have proved "beyond dispute that Mr. Lister, by his wonderful discovery, has enabled the surgeons who adopt it conscientiously, irrespective of the size of the hospital buildings, to reduce the mortality in such cases to 4.36 per cent." But there are Mr. Callender's 44 consecutive amputations at St. Bartholomew's with only one death, and 100 at Pennsylvania Hospital with 17 per cent. mortality, all without "antiseptic" treatment; and there are Mr. Wells, Mr. Keith, Mr. Tait, and others, for and against antisepticism. Moreover, there are other septic influences in crowded or ill-ventilated wards, that increase mortality, other than those that can be destroyed by Listerism; and in regard to statistics themselves there may be many fallacies; the groups of cases compared may contain different proportions of thigh, leg, and arm amputations; new and old hospitals cannot be fairly compared; and error may arise from comparing statistics of the last twenty years with those of the last forty years or more, as in this book, whether hospital hygiene was formerly better or worse. It is not probable that this inquiry will ever be further advanced by an agreement upon scientific data in regard to amputations, and it is therefore reasonable to accept the general impression they tend to convey, of the importance of good sanitary conditions and no over-crowding.

The study of the works noticed in this article impresses one with the fact that great progress has been made in the art of keeping hospitals clean and healthy, and it needs no more proving to show that sufficient room and fresh air are necessary to prevent either sick or well people from poisoning each other by their neighbourhood. Practically there should be no hesitation in following the plain indications, in the direction of simplicity of construction, cleanliness, and good management of hospitals.

Mr. Burdett's excellent work in the interest of cottage and other hospitals, and his large experience in management have taught him that laymen realize far too little the importance of having good hygienic surroundings. It is a part of his purpose in this book to give instruction on this point to laymen who are philanthropically and influentially engaged in such work, and his successful labours in this direction, as well as others, entitle him to warmest commendation and gratitude. E. C.

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ART. XIV.—*Saint Bartholomew's Hospital Reports.* Edited by W. S. CHURCH, M.D., and JOHN LANGTON, F.R.C.S. Vol. XVIII. 8vo. pp. 493, 81. London: Smith, Elder & Co., 1882.

THE first paper in this excellent volume is *On Fitful Recurrent Vomiting.* The author, Dr. SAMUEL GEE, relates the histories of nine cases

which he has collected in his private practice, or in the wards of the hospital. Its study presents an important page to all interested in diseases of childhood. These cases seem to be all of the same kind, their characteristic being fits of vomiting, which recur after intervals of uncertain length. The intervals are free from signs of disease. The vomiting continues for a few hours or a few days. When it has been severe, the patients are left much exhausted. "The oldest of the patients was only nine years, and in four of them the disturbance commenced in early infancy. Abdominal pain is often present, and sometimes so severe, that the vomiting presented itself as a secondary symptom. The condition of the bowels is not characteristic; in fact, the evidence of the disturbance of the digestive function, except in a secondary manner, is almost wholly wanting. The surrounding states and circumstances, which may be looked upon as proximate causes, are not constant."

It is a striking feature in more than a majority of the cases, to which Dr. Gee does not allude, that one, or sometimes both parents of the young patients have been the subjects of severe headaches or megrim, or else that the attacks of vomiting were likely to result from causes similar to those which in adults are seen to result very frequently in periodical headaches with vomitings, etc. It is very possible that a more extended observation of similar cases in children would show pretty conclusively that these vomiting attacks are in reality neural disturbances or discharges, comparable to those found in adults suffering from hemicrania, megrim, or "sick headaches."

In the treatment of these cases, the author has found it sufficient during the attacks to restrict the diet to water, barley-water, or weak meat broths, and to give calomel, or a similar preparation, in small doses of one-fourth or one-sixth of a grain at frequent intervals. To prevent the attacks, when the forebodings of their arrival can be detected, the compound decoction of aloes is administered in doses of one to four drachms; this is especially recommended if the bowels are costive or the fecal matter is whitish in colour, as occurs in some of the cases.

Dr. J. WICKHAM LEGG contributes a *Note on the History of Exophthalmic Goitre*, which is devoted to the consideration of the author to whom we owe the earliest recognition of the condition which we speak of as Graves' or Basedow's Disease. As the author says, it is to Stokes to whom we owe a great part of our present knowledge of the various clinical features which are comprised under the term Exophthalmic Goitre; and it was Stokes who pointed out the earliest as yet discovered observation of this disease, made by an English physician named Parry. The latter's writings date from the end of the last century, but were published posthumously in 1825. In Parry's writing, under the head of "Disease of the Heart," he describes eight cases of simultaneous enlargement or palpitation of the heart and enlargement of the thyroid gland, but it is only in his first case that he mentions the protrusion of the eyeballs.

The date of Parry's observation of this early case is 1786, and the next undoubted case which Dr. Legg has been able to find is an anonymous one published in the *Medico-Chirurgical Journal and Review* for 1816 (vol. i. p. 179). Several other early cases have been referred to by Virchow, Basedow, and others, but in general they can be spoken of as deficient in some one or other of the characteristic symptoms.

Dr. Graves, of Dublin, published the first connected account of the disease in the *London Medical and Surgical Journal* for 1835, in the form of

a clinical lecture, and from this early description, and its republication later in his "Clinical Medicine," his followers and fellow-workers christened the malady with his name. There seem to have been serious doubts with many, especially in Germany, about the priority of Graves's observation and description of exophthalmic goitre, but without justice. The error and confusion have apparently arisen from the fact of there having been two series of the journal in which his lecture was published running at the same time, and his account was printed in one series only.

Von Basedow published his account in Casper's *Wochenschrift* in 1840, under the title "Exophthalmos durch Hypertrophie des Zellgewebes in der Augenhöhle." Dr. Legg thinks from a study of Von Basedow's paper that this author "took a retrograde step rather than one in advance, fixing the attention upon the prominent eyes, and leaving the heart and the thyroid too much in the background." Von Basedow made most prominent the exophthalmos, of which it is true Graves spoke only incidentally. The former of these observers emphasizes the changes in the eyes and proposes the name of *Glotzaugen-cachexie* for the disease: he seems never to have grasped the threefold character of the symptoms, and his picture as compared with Graves's appears distorted and one-sided.

Marsh had, at quite as early a date as Von Basedow, laid due stress on the prominence of the eyeballs in connection with cardiac palpitation and enlargement of the thyroid gland. His remarks before the Pathological Society in 1840, the date of Von Basedow's publication, include a description of the condition of the heart and thyroid, which Graves had previously delineated, and he adds "that, in a majority of these cases, there was a remarkable prominence and protrusion of the eyeballs, so as to give to the group of symptoms by which this disease was characterized a very striking feature."

Dr. Legg concludes his paper by the remark that "if we are to search for the true founders of our knowledge of exophthalmic goitre, it seems that we must look to Dublin—to Graves, to Marsh, and to Stokes; not to Merseburg."

The paper is a very interesting one, showing the growth of our knowledge of this peculiar malady, and will be found useful to any one studying the historical portion of this disease. Much of the information it contains is difficult to come at.

The paper of VINCENT HARRIS, M.D., on *The Diagnostic Value of Cardiac Murmurs* is a brief one; in it there is much material for careful consideration on which further elaboration could be expended with advantage. The author has evidently devoted much thought to his subject, and has given us a very clear estimate of the present condition of medical knowledge. We wish that he had gone further—and we hope that he will on some future occasion—and give us the true relative bearings which the diagnostic value of cardiac murmurs has to the subject of their treatment, provided he will examine the question with the same eyes and from the same point of view with which he has examined this subject.

The object of the paper is "to draw attention to the various ways in which, without great care, it is possible to fall into error, when auscultatory evidence is alone relied upon in diagnosis of the valvular diseases of the heart," "without in the slightest degree wishing to call into question the value of the auscultatory phenomena of heart disease."

The author speaks first of the historical aspect of his subject, of the vagueness of knowledge before the employment of the stethoscope, of the

enthusiasm of Laennec and his immediate followers concerning the certainty of diagnosis of all heart affections by the method of mediate auscultation. It is evident, from a careful study of Laennec's work, that the conclusions which he arrived at from the employment of his "universal" method of diagnosis are less generally correct than those from inspection, palpation, and the general symptoms.

The sober judgment even at that early day was that, in order to arrive at correct results, other methods besides the stethoscope must be employed, and above all that the general symptoms must be compared coincidently with such indications. And this wise conclusion we believe holds to-day universally, although perhaps some might be led to conclude otherwise from a perusal of some recent hand-books on auscultation. We feel quite sure that the idea of a beginner in the art of auscultation and the impressions of a medical student fresh from the clinic too frequently are that a murmur indicates heart disease unequivocally.

The latter half of the paper is devoted to the consideration of the two chief ways in which mistakes may arise in the diagnosis of heart disease, when too great reliance is placed on the existence or non-existence of a cardiac murmur, viz., valvular disease without a murmur, and cardiac murmur without valvular lesions. This part of the paper is codified under two general headings with subdivisions. The first class is heart disease without constant auscultatory signs, and this is subdivided according to the respective valves and the murmurs which are heard at each orifice; cases illustrative of the varying conditions are given along with the opinions of various authors, and the whole is followed by a concise and very satisfactory summary. Under the second class of cardiac murmurs without valvular lesion are given the usually recognized sounds which are spoken of as inorganic or functional.

It would seem, from the facts and opinions derived from this paper as well as from other recent sources, that the whole subject of cardiac valvular disease, and especially the dicta which we now hold in relation to its auscultatory signs, need a thorough revision.

*Clinical Observations on the Larynx in Phthisis.* By J. A. ORMEROD, M.D.—The question of the condition of the larynx in tubercular disease of the lungs has recently excited considerable interest in general medicine, although the subject has much longer been under close observation by specialists devoted to the region. The interest has been one connected not so much with the therapeutic as with a diagnostic aspect. It was thought at one time that a study of the appearances of the larynx would furnish the clue to the condition, or perhaps the character of the lung disease. Most of this interest has subsided recently to a great degree for various reasons; part of it has been swamped in the overwhelming question of the parasitic causation of tubercular disease in general. In the next place it has been shown to be very difficult—in many cases impossible—definitely to decide what lesions of the larynx are tubercular, at least in their earlier stages. Occasionally tuberculosis is found in the larynx and surrounding parts before the lung or other organs are affected. The lung disease ordinarily is well developed before the larynx shows unmistakable signs of tubercular deposit, and of course it very frequently happens that phthisis pulmonalis is far advanced, and death occurs without the larynx showing anything amiss. Even when lesions are found with the laryngoscope, in any grade of phthisis cases, they are far from typical of tubercle. A positive diagnosis can generally be made from the lung conditions, pro-

vided they are present, sooner than from the larynx. It is for these reasons, among others, that the condition of the larynx is of so little comparative value in deciding the nature of the lung disease, and affords so little help in the earlier stages for diagnostic purposes. Therapeutically the problem seems to be a very hopeless one, and the results of treatment are most discouraging. One is almost ready to subscribe with limitations to the saying, "When a disease of the larynx does not get well under treatment, it is tubercular, and when it recovers, it is not."

In this paper Dr. J. A. ORMEROD gives the results of the examination of 100 cases of phthisis taken at random from his out-patients at the Victoria Park Hospital, "whether the patients presented laryngeal symptoms or no. It was thought that such a series would illustrate the frequency with which the larynx is affected in this disease, and afford some insight into the slighter affections which may be presumed to precede the development of severe laryngeal phthisis."

The author gives details of his cases in tabular form; the first table contains twenty-five cases in which the larynx was unaffected by any changes. Thus, in about one-fourth the cases, the organ was not diseased, but in most of these patients the lung disease was slight. Although this number seems small to the author, the proportion is about that given by others.

The second table includes those cases in which only or principally the vocal cords were affected; for the most part the changes consisted of congestion, with thickening, but none of the cases presented the well-marked granulations, described by Stoerk and others, which subsequently undergo a peculiar ulceration. The changes in the cords appear to be of slight importance, except for the hoarseness which comes from them. Hoarseness, even aphonia, may be present without lesions of the vocal cords, in consequence of pressure on the recurrent laryngeal nerves.

The next tablec omprises affections of the ventricular bands, and anæmia of the larynx. This anæmia is not unfrequently conjoined with ventricular band disease, and the condition is sometimes curiously limited to this region. The anæmia has been looked upon as a forerunner of phthisis; hence the significance it has acquired in tubercular disease.

Table IV. relates to the changes in the arytæno-epiglottic region which, as is well known, is frequently affected in phthisis. These folds present as pyriform tumours with their bases downwards towards the median line; this is the appearance, says Mackenzie, which is found in by far the greater number of cases, and when found is characteristic of laryngeal phthisis. These were found by the author in 16 cases of the 100 in which the arytænoids alone were affected, and in 14 others these were affected along with other parts.

The inter-arytænoid region is a very interesting part, and this is treated of in Table V. The gradual development of a tumour arising from the posterior wall and extending forwards covered at first with intact mucous membrane, but subsequently ulcerating, has been regarded as absolutely characteristic of tuberculosis. Tubercle alone makes a tumour in this region, and although the parts may swell from acute inflammation the swelling from tubercle differs from this in that no pain is caused, and even the voice may remain unchanged since the tubercle is deposited below the level of the cords. Stoerk says that the growth may be observed before the physical signs in the lungs can be detected.

Tables VI., VII., and VIII. include more general affections of the various parts of the larynx, subacute laryngeal catarrh, and general tuber-

cular infiltration, and include about one-fourth the whole number of cases, of which the latter group furnishes five cases.

From a general review of the cases, it is evident that in phthisis the larynx exhibits some one or other change, if we include the slight and non-specific lesions as well as the tubercular, with extreme frequency in the phthisical. The posterior part is most frequently affected, and the epiglottis escapes except in the extended acute inflammatory changes; congestion is far more common than anæmia. The symptoms connected with the larynx are not unfrequently disproportioned to the lesions which are to be seen with the laryngoscope, hence it seems important to determine by examination the condition presented before any inference is drawn from them. Hoarseness may result from even the simplest changes, or there may be an ulcerative destruction of the whole or part of a vocal cord. Pain in swallowing is a much more significant sign, since it nearly always points to an affection of the arytænoid region, or to tubercular deposit and ulceration of the epiglottis.

Mr. HENRY T. BUTLIN, under the title *From the Department for Diseases of the Larynx*, gives an account of the origin and progress of this special department of St. Bartholomew's Hospital. This work includes diseases of the throat and nose, and was inaugurated in 1878.

The author speaks of certain groups of cases which have presented themselves; first of enlarged tonsils, and their removal. He says that 150 tonsils have been removed since January, 1881 (from a large majority both tonsils were removed, although this number does not show the number of patients treated). He also says that the tonsils are not removed *merely* because they are enlarged, but because they are producing symptoms. This seems a large number of tonsils requiring removal out of so small a total of patients, less than 300 during the year. The author recommends the use of Physick's guillotine, as the best instrument—it being simple, strong, and easily kept in order; and when this instrument is inapplicable, or cannot be applied, the guarded bistoury is to be employed. The operator uses anæsthetics if necessary for any reason, and speaks favourably of nitrous-oxide gas.

Drs. T. LAUDER BRUNTON and THEODORE CASH give the results of their experience *On the Action of Various Alkaloids on Processes of Oxidation*. Their research was conducted in two series: the first by the comparison of the actions of different alkaloids; the second by the comparison of various salts of the same or nearly allied alkaloids on the processes of oxidation. In the first series thirteen alkaloids were compared, viz., aconitia, atropia, caffein, cinchonine, codia, conia, digitaline, morphia, nicotia, picrotoxine, quinine, strychnia, and veratria. "In each case the influence of the drug on oxidation was tested by ascertaining its effect upon the oxidizing power of the vegetable protoplasm of the potato and the oxidizing power of the blood."

The next paper is an interesting one by Messrs. WALTER H. JESSOP and OSWALD A. BROWNE on *Hemiatropia Facialis*. They give the details of two cases of this rare affection; the first of a girl, aged twelve, in whom the disease commenced five years previously. The left half of the face and head was much altered, and slightly also the upper part of the left chest; curiously, too, there was a strip of superficial atrophy affecting the middle and part of the ring finger of the opposite or right side of the body; the second case concerns a woman aged forty-eight, who had been affected since she was two years old; there was atrophy of the half of the tongue in this case.

The authors give a brief *résumé* of some of the important cases which have been recorded by others (45 in all), and also of the various theories which have been advanced to account for the alterations. They uphold the theory of trophoneurosis, as put forward some years ago by Romberg, the sympathetic, however, playing a prominent part by its intimate connections and conducting strands.

Mr. DAVID A. KING gives some results of *An Analysis of Seventy Cases of the Typhoid Epidemic of* 1881–2 that occurred in the hospital. The investigation is confined "to an examination of a few matters upon which less uniformity prevails" among the many phenomena of typhoid fever. "The first point investigated was the influence exerted on the course and termination of the disease by the period of its duration at which the patient was admitted to the hospital." This question has been reported on in relation to several diseases. In *The American Journal of the Medical Sciences* for 1837, Drs. Gerhard and Pennock showed the influence of late admission in typhus fever to be very unfavourable, and at the same time very striking.

The author's work is arranged in a series of tables which very clearly indicate that in typhoid fever this influence is equally unfavourable. The effects of late compared with early admissions show increased death-rate, prolonged duration of the disease, a greater tendency to relapse, and increased severity of the symptoms and increased number of complications. This is the result which, *à priori*, would be expected; the surprise is that the percentage of the evil result is not greater than stated. Perhaps the unfavourable showing is modified and lessened in this epidemic as compared with other outbreaks or isolated cases by the fact that, in the epidemic dealt with, there was a striking absence of diarrhœa.

Mr. LAWRENCE HUMPHREY furnishes *Some Observations on the Tubercle-Bacillus in Lung Diseases.* He prepared his specimens by Erhlich's method. The results obtained corresponded in great measure with the observations of others, as derived from the examination of the sputa and scrapings from the caseous masses in the lung.

Dr. NORMAN MOORE contributes some *Pathological Observations on the Pancreas.* The details are given of a case of thrombosis of the pancreatic veins not followed by abscess of that organ; of two cases in which, with thrombosis of the portal and other veins, the vessels of the pancreas were free from involvement. The author has found, in correspondence with the observations of others, that the pancreas usually remains without infiltration in cases of lardaceous (amyloid) disease of the organs; he gives a record of one case in which the reaction to the iodine test was visible in the organ in conjunction with the general wide-spread visceral infiltration throughout the body. The paper also calls attention to changes taking place in the pancreas in conjunction with and of similar kind to cirrhosis of the liver; in these cases it is probable that the involvement of the pancreas increases the impaired digestion due to the alterations of the liver and its function.

Drs. SAMUEL GEE and JOHN ABERCROMBIE report *A Case of Lesion of the Sympathetic Nerve of the Neck.* The disease was due to sarcomatous tumours surrounding the bodies of several of the cervical and upper dorsal vertebræ. The diagnosis was not made during life, as the fluctuating masses were looked upon as due to caries of the vertebræ. Many of the symptoms varied from those usually described in maladies of this nerve, and the authors concluded that the diagnosis could perhaps have been

arrived at from closer attention to the ocular symptoms—viz., the slight ptosis and the condition of the pupil, together with the other phenomena.

Dr. SAMUEL WEST contributes a short article on the relation of *Pain and Hemorrhage*, which is interesting, and the experience given corresponds probably with that of every observer. His cases are arranged in two groups—viz., pain preceding hæmatemesis and pain preceding hæmoptysis. He says of the first group, that "we are tempted to refer the pain in these cases to the extension of the ulceration, but this will not explain the striking and persistent relief which the bleeding gives to the pain." The pain of the same sort frequently exists and finds relief in hemorrhage, when no ulceration can be found *post mortem*. The author thinks that, both in the case of the stomach and of the lung, a more or less sudden congestion may be the factor common to all these cases, and productive of the pain which finds relief by bleeding. By this congestion organs may become painful which, in the ordinary meaning of the term, are not sensitive. We see it in menstruation and in acute nephritis. Instances might be multiplied, but these give illustrations of what is a common pathological association. The statement has a very useful application in a practical point of view. The relief of pleuritic pains furnishes a not infrequent example.

Clinical cases from Dr. GEE's wards, the first of which is of *Locomotor Ataxy, associated with Perforating Ulcer of the Foot.* The patient had a chancre many years previous to the development of the ataxic symptoms, which had existed for three years; a year subsequently a hard corn over a metatarsal joint ulcerated, and later a second corn threatened to form a similar perforation. The special interest of the case arises from the apparent involvement in the same patient of the sensory strands of the spinal cord—the ordinary lesion productive of locomotor ataxy—and also the sensory and nutrient fibres, which, according to Savory and Butlin, are affected by disease or degeneration in perforating ulcer of the foot, thus giving a natural colour to the idea of a connection existing between the two diseases. Ball and Thibierg, at the Medical Congress of 1881, narrated twelve cases, "with the object of proving that the connection existing between the two diseases is a direct one." Mr. F. Treves has recently communicated his opinion in the *Lancet* that the relation between the two is "casual and unimportant, and of little clinical value." The other cases included in the paper are one of subacute anterior general spinal paralysis, and one of hereditary locomotor ataxy.

Mr. HENRY SMITH reports *A Case of Intracranial Aneurism* in a patient 16 years old, who had been in good health, and was free from any other visceral disease. The aneurism was the size of a pea, situated on a branch of the left middle cerebral artery, just within the fissure of Sylvius. It was ruptured, and there was a large effusion of blood under the pia mater, especially at the posterior part of the base of the brain. About a square inch of the left middle cerebral lobe was softened and broken up by clots of blood connected with the aneurism. The age of the patient forms a striking feature of the case, especially in connection with the absence of cardiac valvular disease. During life the patient was supposed, from the misleading history, to be suffering from chloroform poisoning with prolonged unconsciousness, artificial respiration was kept up for eighteen hours, without, during that time, a single respiratory effort being made by the unconscious patient. Howard's direct method was mostly employed.

The concluding paper is by Dr. Dyce Duckworth, and is on *Diabetes in relation to Arthritism*. Arthritism, the author points out, is the arthritic diathesis, or peculiar disposition attaching to certain persons and families, whereby affections of the joints are liable to occur, and these especially of rheumatic or gouty nature. This paper is intended as a contribution to the subject of diabetes as connected with the arthritic diathesis, of which in English literature there is not much to be found. The German and French schools make varieties of this malady, and distinguish between the temporary glycosuria and an abiding diabetes. It is with the former class that the author proposes to deal—those cases which fall into the category of the milder and sometimes latent, or masked, forms of diabetes. "In such cases the relation to the arthritic state is sometimes very plain, sometimes less so. It is also the fact that such forms of diabetes exist, having no relation to arthritism, so far as can be discovered. From these there may be, and there have been, found other diathetic relationships. I mention these matters at the outset, lest it should be supposed that I seek to claim for all cases of mild diabetes a relation to the arthritic condition."

The author does not feel prepared to furnish more than a sketch of the relation of arthritism to diabetes. Some connection between the gouty diathesis and diabetes has long been known, though few writers on these disorders allude to this relationship; but little light has been thrown on it, and it is one of extreme abstruseness.

Many short quotations from various authors, from the time of Prout (1843) to the present, show that this relationship has been observed for many years. Prout had classified diabetic patients into two groups, the spare and feeble, and the robust and corpulent type, and it was among the latter that he saw alternation between gout and diabetes. To such cases he applied the term latent diabetes. The late Dr. Bence Jones (1853) described intermitting diabetes, where the glucose alternated with an excess of urates. Dr. Gairdner (1854) wrote of saccharine impregnation, not amounting to any diabetic tendency, attendant on various phases of gout. Claude Bernard (1855) saw cases of alternating diabetes, in which attacks of gout or rheumatism replaced glycosuria, the urine being charged with uric acid. Laycock (1862) says that the gouty diabetic patient did not waste or become tuberculous. Marchal (1864) believed that gout and diabetes were only different expressions of the same morbid state—sub-diatheses of the uric acid diathesis. He regarded uric or gouty diabetes as the common variety and type of diabetes. "His theory was that when the uric acid diathesis affected the solids, it gave rise to gout or rheumatism, and when it affected the blood itself it set up diabetes, and that diabetes was nothing else than gout in the blood." Lacorché, Trousseau, Charcot, Lancéreaux, Garrod, Gull, Roberts, Lauder Brunton, and Dickinson, all hold the belief, or have recorded the dependence of glycosuria upon a gouty or uric acid diathesis, or in some manner these two states alternating with each other.

Dr. Ord has recently analyzed twenty-two instances of glycosuria (no case merited the title of diabetes), and found the disorder, considered as a symptom of other troubles, associated with four conditions of importance: 1. Nervous disorder; 2, gout; 3, errors of diet; and, 4, albuminuria. Dr. Ord "declares for the nervous origin of the glycosuria, either as a central or a reflex disorder, and ingeniously offers an explanation for the intermittent form of the symptom in the gouty, comparing the disap-

pearance of the sugar to that which occurs in diabetes during intermittent inflammations, the glycosuria being, perhaps, 'a phenomenon of the same class as gouty inflammation of the joints, an active hyperæmia set going in part of the gouty process, set going in relation to irritation excited in the liver by dietary errors, or other causes, just as inflammation of a joint is set up by a wrench, or by over-exertion; that it may, in fact, be taken as meaning gout of the liver.'"

The weight of authority, then, seems to be that there is a diathetic glycosuria—perhaps more than one form—as distinguished from a substantive diabetes. However, it must not be forgotten that the temporary, perhaps diathetic forms of glycosuria, may become an essential or confirmed diabetes, if neglected. The distinguishing of the diathetic from the essential form of diabetes is not to be arrived at by the aid of the physiologist or the chemist, for the question is purely a clinical one. The older opinion was that gout and diabetes were in positive antagonism, and it has been observed that the symptoms of gout vanish as the diabetic symptoms supervene. Garrod explains this latter phenomenon by supposing that increased urinary discharge washes out the accumulated uric acid matters from the blood. Dr. Duckworth's own observations show the extreme infrequence of glycosuria in cases of well-marked gout; glycosuria comes in cases of irregular or incomplete gout. This rule does not hold for cases of rheumatic type, for in them the joint-affection appears to be present in a severe degree together with glycosuria. In rheumatoid arthritis the exacerbation of the symptoms does not exercise any beneficial effect upon the glycosuria. The number of cases of the rheumatic type with glycosuria is very small as compared with the gouty type. Charcot does not believe that diabetes has ever been observed as a complication of chronic rheumatism, and he points to Griesinger's statistics for confirmation of the statement. Garrod and Ord have, however, both observed cases.

"The most obvious fact to be noted in most of the cases now under consideration is that the patients do not present the ordinary aspect, or recognized symptoms of diabetes, as commonly understood." The recognition of these cases is oftentimes arrived at accidentally, since they present few or none of the prime symptoms of diabetes. The outlook for the patient depends upon the early cognizance of the malady, and our ability to deal successfully with the underlying diathesic condition. A gouty diabetes, which at first is generally intermittent, becomes, unless checked, pretty rapidly a confirmed state, which is just as hopeless, perhaps even more so, as the usual form of diabetes.

It is obvious that a strictly anti-diabetic diet, while efficient against the glycosuria, must tend to increase the gouty condition, and thus render the patient worse in the end.

The author presents a number of records of cases illustrating the diathesic relationships to saccharine urine. M. L.

The first surgical paper is by W. J. WALSHAM, narrating *Some Cases of Deviation of the Nasal Septum*, five in number, which occurred in connection with the hospital practice in one year. Three of the cases had their origin in blows; in one it was congenital, and in one no cause could be assigned, although it had existed for ten years. The deformity, which varied in amount, interfered with proper respiration, and was remedied in three cases by forcible straightening, and in two forcible straightening

was combined with a subcutaneous stellar incision. In one case a slight perforation of the septum was a permanent result, but the treatment gave satisfaction. Only two other instances of this deformity have been observed at the hospital during the past ten years. It is therefore thought by Mr. Walsham that the record of these cases has a proper place in a volume which theoretically at least is a report of the year's work.

Mr. Howard Marsh celebrates his withdrawal from the Orthopædic Department by a paper of some length, being *Notes on Orthopædic Surgery*, in which the subjects of rickets, knock-knee, and lateral curvature are considered. A general description of rickets is given, and emphasis is laid upon the fact of its ready response to treatment by cod-liver oil, fresh air, and proper nourishment. The large experience of Mr. Marsh has convinced him that in early years there is every disposition for bent bones to straighten, and he thinks that osteotomy is rarely required. In knock-knee Mr. Marsh thinks that the tibia is more often at fault than is the opinion of Dr. MacEwen, who holds that the bowing inward of the lower part of the femur is the chief cause of the deformity. When knock-knee is once fairly established Mr. Marsh does not think that there is much hope of the limb straightening with the growth of the child. In the incipiency of the deformity, rest, and keeping the child off its feet will accomplish much; but later the only remedy is a resort to some mechanical device, or osteotomy. This latter, as recommended and practised by Dr. MacEwen, Mr. Marsh has had considerable experience in, and has been satisfied with the results. The slight deformity introduced by division of the femur has, in Mr. Marsh's hands, been attended by no inconvenience. He draws attention to the fact that the operation does not affect the condition of the relaxed ligaments, and that some support is often required until they recover tone and are relatively shortened.

Flat-foot, Mr. Marsh thinks, has its origin most commonly in long-standing, superadded to rachitic changes in the bones and ligaments. He points out that its treatment to be successful must be early and preventive. Regulated exercise by the patient raising up on tip-toe is a most efficient means of improving the muscular tone, which with as much rest of the parts as is practicable and proper diet is the most hopeful treatment in the early stages. When the arch of the foot is lost, and there is rigidity of the tarsal joints, Mr. Marsh advises a forcible bending of the foot under an anæsthetic, and placing it in a plaster dressing to maintain the position. He also suggests a modified shoe with an elastic spring in its sole.

In the treatment of lateral curvature of the spine there is nothing new recommended. Mr. Marsh pretty vigorously attacks the plaster jacket of Dr. Sayre, preferring the poro-plastic one. We think he errs in supposing that Dr. Sayre advises the permanent encasing of the trunk in these cases. Such is not the case, as Dr. Sayre is very explicit in stating that it is only to be worn during the day. There is really no difference between these gentlemen in the opinion that in regulated exercise lies the best treatment for these cases, and that supports, whether of steel, felt, or plaster, are only adjuvants. The "vigour and enthusiasm" of Dr. Sayre appear to have stirred up some similar qualities in Mr. Marsh, who shouts "poro-plastic" as vigorously as the Bellevue professor cries "plaster." The paper is able, and valuable as the result of experience.

The next article is also one of great interest to surgeons, and one upon which its writer has expended much labour. It is entitled, *Imperforate Rectum and Anus in Infants*, by W. Harrison Cripps. It consists of

a thorough, succinct, and discriminating study of the subject in continuation of the work done by Curling and Bodenhamer some years since. Mr. Cripps has collected one hundred cases which have occurred during the last twenty years, and has carried on a correspondence with many of their reporters, thus seeking to present the ultimate results, whether successful or otherwise. By this means he has sought in the one class to ascertain the anatomical difficulties revealed by post-mortem examinations, and in another the amount and permanence of the success which has followed operative interference. Many surgeons are indisposed to undertake a search for the bowel in these cases from the difficulty sometimes encountered, and the large mortality attending the procedure. The mortality is, indeed, large, reaching 50 per cent.; but, on the other hand, the results are sometimes satisfactory in an eminent degree. Mr. Cripps records some of these results at considerable detail.

There is one very important deduction which can be drawn from Mr. Cripps's table, namely, that simple puncture, while in some instances attended by temporary relief, has a very high mortality, from the contents of the bowel escaping into the peritoneal cavity in very many cases. Then it is quite easy to miss the rectum by blindly thrusting for it with a trocar, when it could easily have been found by a careful dissection carried on up the face of the sacral curve. Verneuil has in two instances successfully removed the coccyx, thus obtaining more room for the dissection. When the search for the bowel is successful, Mr. Cripps is inclined to agree with Dr. Thorn, of Toledo, that it is inexpedient to attempt to draw its mucous membrane down. The tendency to contract, which almost always exists, is to be overcome by the use of conical bougies.

Should the bowel not be found *in situ*, the surgeon should at once open the colon either by Littré's or Amussat's operation.

This paper is one to which reference will frequently be made, and is not favourably placed, but rather hidden away in the pages of a serial with but a limited circulation. Good work would be done for the profession if some publisher were to issue collections of such elaborate statistical studies from time to time. Such a series would be both popular and valuable.

*Remarks on the Scoliotic Pelvis* is the title of a paper by FRANCIS HENRY CHAMPNEYS, M. B. It consists of a summary of Leopold's views, and a study of seven specimens contained in the museum of St. Bartholomew's Hospital. Tracings of the brims of these pelves are given, and the paper is an important contribution to the study of pelvimetry.

Mr. JOHN LANGTON contributes an exceedingly interesting paper on *Hernia of the Ovary*, which is instructive as well. It tends to show that the presence in the labia or inguinal canal of a body having all the characteristics of the ovary is by no means so rare as is sometimes supposed. Mr. Langton has met with them at all ages, but has failed to make out any malformation of the genital organs, further than a slight deflection of the uterus to that side, when only one ovary had descended. This is not in accord with the views of Englisch, who is of the opinion that malformations are frequently present with ovarian hernia. Altogether Mr. Langton has seen sixty-seven cases, but in only one has he had the opportunity of verifying his diagnosis by an autopsy, when the ovary with its Fallopian tube was found protruded. In twenty-five cases there was hernia of intestine present, and in forty-two the ovary was unaccompanied with enterocele. Out of 589 cases of congenital inguinal hernia

in female infants, observed by Mr. Langton at the London Truss Society during eight years, there were forty-three, in which these movable bodies or ovaries could be distinguished, and of these cases twenty-nine were reducible. Out of 3495 cases of inguinal hernia occurring after the first year of life in females, twenty-four were ovarian. Mr. Langton concludes that cases calling for surgical interference on account of malposition are, comparatively speaking, very rare. In only two has he seen such an amount of suffering as to lead to the suggestion of an operation, but in neither could the consent of the patients to such a procedure be obtained. This paper is well worthy of careful study.

Mr. W. J. WALSHAM essays to answer the question, *Is Trephining the Skull a Dangerous Operation per se?* by a comparison of the different estimation in which the operation has been held at different times, and an examination of some recent statistics. The unreasonable antipathy with which the measure was regarded twenty years since, and which still represents the mind of some first-class surgeons upon the subject, has been succeeded by a disposition to regard it as an almost trivial operation void of danger, and one to be most frequently resorted to. How strong was the feeling against the operation is shown by the fact that in France during ten years but four instances of trephining occurred, while so great has been the revolution in the minds of some observers that we hear of M. Sédillot recommending a resort to it in all fractures of the skull, and even as a means of diagnosis. Mr. Walsham's object is to ascertain how largely the mortality following the use of the trephine depends upon pre-existent conditions, and how much upon the operation itself. He has collected no less than 686 cases with 417 recoveries and 269 deaths, and has divided them into five classes: preventive, immediate curative, intermediate curative, delayed curative, and late trephining. It is evident that it is from this last class of cases, uncomplicated with acute inflammatory changes or extensive injuries, sufficient in themselves to lead to a fatal end, that we can best arrive at a correct estimate of the real dangers of trephining *per se*. There are 122 cases belonging to this class tabulated by Mr. Walsham, with a mortality of only 10.6 per cent., and he points out that in most of the fatal cases there was some special circumstance present which may account for the untoward result. Mr. Walsham has also tabulated and subjected to analysis twenty-two trephinings performed at St. Bartholomew's during the last twelve years, in which all of his subdivisions were represented, which were followed by ten recoveries and twelve deaths. He is particular to point out that in only two of the fatal cases belonging to this series could the trephine be regarded as the cause of death.

Mr. Walsham concludes that in suitable cases, and with the improved methods of treatment of the present day, we need not be deterred from resorting to trephining, as the risk from the operative procedure is slight. The paper and its appended tables constitute a valuable addition to surgical literature.

*Three Cases of Removal by Operation of Cancer of the Rectum* is the title of the next surgical article, by Mr. MORANT BAKER. It is a model paper for a volume of Hospital Reports, being a succinct account of cases occurring within the practice of the hospital. In one of the cases, the peritoneum was injured, and the patient speedily succumbed to inflammation of that membrane. In the second case, the operation required to be repeated, and, although not finally successful, pain was diminished, and life prolonged by a resort to it. In the third case, there

was entire and gratifying success, there being no return of the disease, with continued comfort and good health one year after the operation. Mr. Baker thinks that in every case of cancer of the rectum the question whether it can be relieved by operation should be carefully and at once considered.

Mr. WALTER S. A. GRIFFITH contributes *Notes of a Fatal Case of Perimetritis* occurring in a woman, aged fifty-two years, and which at first was regarded as cancer. The patient died, and a very good description of the specimen obtained, post mortem, is included in the paper. There was no evidence of injury, of cancer, or of fibroid growth.

Mr. ALFRED WILLETT has next a *Note on Manipulation as a Means of Treatment of Flat Foot, in the Acute Form.* The plan pursued is the same as that to which reference has been made in speaking of Mr. Marsh's paper. Mr. Willett, where there is much pain and stiffness, forcibly bends the foot, restoring the arch, and confines the foot in that position by a heavy plaster dressing and a peculiarly braced shoe.

*Some Notes on Tracheotomy* is the title of an article by W. E. STEAVENSON, M.B. The experience of the writer has been large with this operation, and he has grouped together in this article some of his observations. He gives a series of cases in which, as is by no means unusual, it was difficult to get the patient to do without the tube, and points out that it is only by persistency, gentleness, and tact, that the difficulty can be overcome, and that it is of the utmost importance that the attempt to remove the tube should be made as soon after the operation as possible. Mr. Steavenson prefers to have his cases watched by relays of students rather than by trained nurses, as the latter become discouraged after a series of unsuccessful cases, and are apt to relax effort. The fatigue attendant upon such cases is also great, and then it is of great importance that medical men should have a practical acquaintance with the details of nursing required. There are numerous hints contained in this paper, evidently born of experience, which will repay its perusal.

The medical antiquarian will be interested in an article by NORMAN MOORE, M.D., on *The Physicians and Surgeons of St. Bartholomew's Hospital before the Time of Harvey.* Much that is curious in the habits and modes of living in those days is revealed by the researches made by Dr. Moore, but there would seem to be no information possessed by our early predecessors which is of much value to the present generation. The paper is pleasantly written, and forms an agreeable literary oasis in the midst of purely scientific contributions.

It will be seen by the cursory account we have endeavoured to give of the surgical papers contained in this volume that they are of more than average value and importance. S. A.

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ART. XV.—*On the Pathology of Bronchitis, Catarrhal Pneumonia, Tubercle, and allied Lesions of the Human Lung.* By D. J. HAMILTON, M.B., F.R.C.S.E., F.R.S.E., Professor of Pathological Anatomy (Sir Erasmus Wilson, Chair), University of Aberdeen. With Illustrations. 8vo. pp. 248. London: Macmillan & Co., 1883.

THIS work had its origin in a series of papers which appeared in the *Practitioner* during the years 1879 and 1880. The author has since

carefully revised his observations and made the alterations necessary to bring the subject-matter up to the present day. The volume is inscribed to Erasmus Wilson, "as a tribute to his magnanimity in promoting pathological sciences." The tribute is worthy.

These papers, read with interest at the time of their appearance, constitute a valuable contribution to the subject of which they treat, in their present form. The very abundance of the material reaching the profession by way of the journals too often takes from that which is best in it the half of its worth. The hurry of perusal, the breaks in connected purpose through serial appearance, the disjointed thinking incident to the abrupt change of themes in the make-up of a well-edited journal are prodigal of work such as we have here. To read is to dimly remember; oftener at once to forget. It is fortunate that the most of the much read is far better promptly forgot. But something we would like to keep goes with those we gladly lose. Laying aside for future reading and careful indexing only help the worker in special fields, they are useless for the general journal reader. Next week's wave of work will sweep alike the interest felt in last week's journal and the time to read it into oblivion. Many of the best monographs are in fact reprints. In this there is a twofold advantage. The author may make careful and deliberate revision; the reader finds, after a time, the articles he had intended to re-read ready bound and readable in complete and finished form.

The book is divided into two parts. Part I. treats of Bronchitis. There is no class of diseases more common than those characterized by catarrhal affections of mucous membranes, and there are no lesions of which the pathology has received less systematic study, and is, therefore, less accurately understood than the inflammatory lesions of these tissues. In catarrhal diseases of the bronchi, we have, perhaps, the most common and the most important of the affections of this class. The author's field of investigation is a familiar one, but the facts which are the objects of his study are little known. His method, which in the laboratory is not unmindful of the ward, and in the specimen does not wholly overlook the patient, is fortunate and not common enough among teachers of pathology, who, in devotion to one line of work, often forget that the ultimate aim of all the branches of medical science is the prevention of disease and the healing of the sick. His style is clear, fluent, and consequent. If his views are occasionally at variance with established doctrines, they are, for the most part, well reasoned out and definitely expressed.

The practical questions which he seeks in the present inquiry to answer, are: Where does the catarrhal secretion come from? Of what is it made up? Why does the catarrhal inflammation in some cases tend to pass off, and allow the mucous membrane to resume its normal function, while in others it assumes a chronic form, in which there is the greatest difficulty in bringing about a favourable result?

The structure of the normal bronchi and their surroundings is first described. The epithelium of the *mucosa* is composed of three layers, the superficial cells being columnar and ciliated, those underlying them transitional in shape, while deeper still is a flat layer resting upon a homogeneous basement membrane. The cells of the deepest layer resemble the endothelial cells of serous surfaces, and have been described by Debove as an endothelium underlying the epithelium proper in the trachea, bladder, and intestine. In the smallest bronchi these layers are no longer seen, the epithelium consisting of a single layer of somewhat cubical cells,

and in the air-vesicles the cells are flattened and extremely delicate in contour, resembling in all respects the endothelium of a serous surface. It would, therefore, appear that the structural type of the epithelium covering the whole of the air-passages, from the trachea downwards, is flat, and that the columnar cells in the bronchi are merely accessory to the underlying squamous layer.

*The basement membrane* which gives support to the epithelial covering and separates it from the underlying vessels and elastic fibres of the inner fibrous coat, is a perfectly homogeneous translucent substance. It is not acted upon by strong acetic acid. Carmine stains it of a pinkish colour; other re-agents, as silver nitrate, perosmic acid, etc., fail to develop any traces of fibrous or cellular structure in it. This membrane is always seen in man, but its structure and relations are best studied when, in catarrhal affections of the bronchi, in which it plays an important part, it has become œdematous.

*The inner fibrous coat* gives to the mucous membrane its fibrous character. Mainly composed of elastic fibres, it is abundantly supplied with branches from the bronchial artery, which form a rich plexus beneath and in contact with the basement membrane just described. This coat also contains plasma spaces, which are the radicles of the bronchial lymphatic system.

*The muscularis* lies next to the inner fibrous coat, and is to be regarded rather as part of the mucosa than as a separate investment.

*The outer fibrous coat* or *adventitia* is shown by the author to be of high importance in the investigation of the changes that take place in acute and chronic bronchitis. This structure embraces in part the framework of support to the lung. Composed of loosely disposed bundles of white fibrous tissue with intermingled elastic fibres, arranged concentrically to the bronchus and passing continuously into the adventitious coat of the larger branches of the pulmonary artery, it is continuous also with the coarse fibrous bands which separate one primary lobule from another (the lobular or interlobular septa), and which, followed outward, are found to pass to the deep layer of the pleura. Branched spaces of considerable size, the lymphatic spaces of the bronchial tissue, intervene between the bundles of fibres composing this tissue. These spaces, readily traced outward by means of the carbon particles, which form a natural injection in the lung of the coal-miner, are found to communicate with similar spaces in the fibrous tissues surrounding the pulmonary artery, while these again are continuous with larger lymph spaces in the lobular septa. The lymphatics of the lobular septa pour their contents into the rich ramifying plexus of the deep layer of the pleura, which communicates with the bronchial glands at the root of the lung. The superficial layer of the pleura never becomes pigmented, and probably has few or no communications with the deeper layer.

*Lymphatic glands* are continued along the bronchi to a considerable distance within the lung substance; they are represented opposite the bronchioles by peri-bronchial lymphoid deposits, situated in the adventitia.

*The mucous glands* are racemose, and open into the bronchus by a trumpet-shaped orifice. They are found in bronchi provided with cartilages, and lie partly in the spaces between and partly on the inner surface of the cartilages. Their deep epithelial layer appears to be continuous with the deepest layer of the epithelium of the trachea and bronchi (Debove's membrane), and resembles it in character. The superficial layer which lines

the duct of the gland and is lost in its alveoli, is, like the superficial layer of the bronchial epithelium, columnar and ciliated.

Having considered the anatomy of the bronchi, the author next investigates the mode of regeneration of their epithelial covering under normal conditions.

Unlike as are the cells of the three layers of epithelium, they are seen to be simply stages of development of the same cellular element, the deeper layers being the "raw material," from which the perfect columnar cell arises.

The function of the mucous glands seems to be in great part, if not entirely, the secretion of the fluid element of the mucus. In bronchitis this function is exalted to an extreme degree. Mucous corpuscles are doubtless also derived from the epithelium of mucous glands, but the chief source of these bodies is the germinal or primitive layer of the bronchial epithelium, of which they are the crude product thrown off in an unfinished condition. In the healthy subject, mere mechanical congestion lasting only a few hours is capable of giving rise to great œdema of the basement membrane and desquamation of the superficial layer of epithelium lining the larger bronchi. At the same time small round cells, apparently leucocytes, escaping by diapedesis through the distended walls of the bloodvessels accumulate in the fibrous coat of the mucosa.

These are the changes, also, which occur in the early stages of acute bronchitis. The columnar epithelium being shed, there is no attempt at its reproduction so long as the congestion continues. An excessive proliferation of embryonic epithelium (transitional forms) takes place. These cells, accumulated upon the surface and mingled with the secretion of the mucous glands, constitute the catarrhal secretion. At the same time the branches of the bronchial vessels are seen to be dilated, and the inner fibrous coat infiltrated with cellular structures, having their origin partly in the flat endothelial cells and connective tissue corpuscle of the inner fibrous coat, partly in leucocytes derived directly from the over-distended bloodvessels. These elements crowd outward toward the lung tissue, but never, according to the author, make their way to the free surface of the bronchi, being prevented by the basement membrane, which affords a constant boundary line between "what is epithelial and what belongs to the fibrous tissue of the mucosa."

The lymphatic glands at the root of the lung are invariably enlarged, the lymph-paths choked with "catarrhal-like" cells, the lymph-corpuscles increased to an inordinate degree, and the vessels deeply congested. Chronic bronchitis is considered under four separate headings, according as it is due to one or another of the four following causes: (*a*) an acute attack; (*b*) valvular disease of the heart; (*c*) inhalation of foreign matters; (*d*) chronic interstitial nephritis. The greater number of cases originate in an acute attack which has never undergone complete resolution. After a description of the gross and microscopic appearances, the author points out with force the part played by the basement membrane, which is constantly present, and "apparently indestructible." The presence of this membrane is a most important determining cause in the direction taken by the cell elements, which infiltrate to an enormous extent the fibrous layers and peri-bronchial tissues. Were it not for this elastic but impenetrable structure, they would wander towards the free surface of the bronchial mucosa, its epithelial being shed, and be thrown off from that surface as from a granulating wound, naturally taking this direction

as that of least resistance. On the contrary, they accumulate in the fibrillar interspaces of the inner fibrous coat, until, by pressure, they sufficiently distend these spaces to permit their passage outwards into the outer fibrous coat and lobular septa.

That form of chronic bronchitis caused by valvular disease of the heart is, in fact, a mechanical irritation due to regurgitant blood-pressure, not a true bronchitis. The secretion, which is poor in cellular structure, is, for the most part, composed of mucus from the mucous glands, and serum from the general mucous surface, and the excess of both is due to increased blood-supply and consequent œdema. The appearance known as *brown induration* is due to vesicular hemorrhages, capillary distension, and accumulations of degenerated alveolar endothelium.

A few pages are devoted to the consideration of chronic bronchitis due to the inhalation of foreign substances. Attention is directed to the fact that a form of bronchitis is extremely common in coal-miners in middle and old age. The expectoration in these cases is commonly yellow, muco-purulent, and not pigmentary, though the lungs may be found after death to be perfectly black. Upon microscopic examination of such lungs, the larger, middle-sized, and most of the smaller bronchi are *not pigmented.* "The catarrhal discharge which is found lying within them is of the usual yellow muco-purulent character, and neither to the naked eye nor microscopically is there to be found any evidence of the inhaled particles making their way through the mucous membrane of the bronchi." The explanation of this interesting fact is to be found in the resisting character of the basement membrane. The inhaled pigment particles find access to the lung parenchyma at the terminal structures of the bronchi, where this membrane is no longer to be made out. Penetrating the smallest bronchi, infundibula, and air-vesicles, they find their way into the peri-bronchial and peri-vascular lymph spaces. Thence they enter the lobular septa, still following the lymph channels, then the deep layer of the pleura, and they pass, finally, to the bronchial glands, thus making a complete natural injection of the lymphatic system of the lungs. The superficial layer of the pleura, which contains the lymphatics proper of the pleura, is not pigmented. The bronchitis is, in these cases, due to interference of the circulation by accumulations of pigment particles around the minute blood-vessels, the plugging of the lymph channels, and the resulting œdema of the interstitial fibrous tissue, especially that of the mucous membrane of the bronchi, by which the epithelium is kept in a state of constant irritation.

The microscopical appearances in bronchitis due to chronic interstitial nephritis differ from those found in the first described form, due to incomplete resolution of an acute attack, in no respect save that the muscular coat of the small arteries shows great hypertrophy.

The pulmonary affections which occur as complications and results of bronchitis are next studied. These are chronic interstitial pneumonia, vesicular emphysema, collapse of the lung, bronchiectasis, and occasionally catarrhal pneumonia. The last, in acute bronchitis, results from the inhalation of catarrhal products, whose cells denote their bronchial origin, into the vesicles during violent inspiratory effort.

Part II. treats of Catarrhal Pneumonia and Tubercle in the Human Lung.

Applying to this investigation the method employed in the study of bronchitis, the author seeks to trace out the "so-called catarrhal

changes which affect the alveolar walls, with special reference to their essential nature and mode of origin; and to show what the course, usual terminations, and complications of such pneumonic processes are." He draws, for the purpose of clearly setting forth his views, a brief contrast between this and "croupous pneumonia;" and, for the reason that the subject of "tubercle" is inextricably bound up with that of catarrhal pneumonia in its different stages, he aims to show what the mutual relations between it and catarrhal pneumonia are.

As a necessary preliminary to this study he considers the structure of the wall of the normal air-vesicle.

Its epithelium has the characters of endothelium. It is only to be seen after silver-staining. Its cells are large flat plates with sinuous bodies, usually having in their centre a nucleus, which is visible in staining with colouring reagents, such as hæmatoxylon. In many of the cells no nucleus can be seen. Besides these, other smaller cells, polygonal in outline, and granular in consistence, are seen. The author regards these as embryonic epithelial cells, which are constantly germinating, and points out the significant fact, in view of the greater predisposition of young individuals to catarrhal pneumonia, that these germinating groups are more numerous in the young than in the old. The alveolar wall is further made up of elastic tissue and small bundles of white fibrous tissue with occasional connective tissue corpuscles, an abundant plexus of capillary bloodvessels and a system of plasma spaces, which constitute, in fact, the radicles of the lymphatic system of the lung.

Although there is little evidence that the granular embryonic cells above described are of a connective tissue type, yet their pseudo-stomatous action in transferring foreign bodies from the alveolar cavity to an underlying lymphatic, as claimed by Klein and others, can be verified.

The structure of the alveolar wall and that of serous membranes, such as the pleura or peritoneum, are analogous. The essential point of difference relates to the origin of their endothelium. That of the peritoneum and of most serous structures is referred to the meso-blast; that of the pulmonary tissue (epithelium) is derived from the hypo-blast. To the distinctive character implanted upon these two structures in fœtal life must be referred the difference of their action under pathological conditions. Under the influence of undue stimulation both are liable to germinate, and in both the appearances during the germinating stage are much the same, but while the result of this process in the peritoneum or pleura is usually fibrous tissue and adhesion, no such fibrous tissue ever results from inflammatory cell proliferation in the vesicular structure of the lung.

The author paves the way for the study of catarrhal pneumonia by a consideration of the effects of increased blood-pressure suddenly applied to the bloodvessels of the lung, as contrasted with the effects of long-continued excessive blood-pressure in the lung. Under the former condition a croupous exudation is thrown out; under the latter the capillaries become permanently distended, the epithelium desquamates, and a certain amount of serum exudes. The course of catarrhal pneumonia is divided into the three stages which correspond to three distinct phases in its clinical history: 1. The acute or subacute stage; 2. The stage of caseation; and 3. That of phthisis or destruction of the lung. The description of the pathological changes characteristic of each of these stages, and of their bearing upon the symptomatology of the disease, deserves the highest commen-

dation. It should be read by every practitioner. It is a graphic presentation of a subject that those who have not had the opportunity of laboratory work have seen, familiar as it is, only as a picture of blurred lines. Here it is sharp, clear-cut, and well worked out in every detail.

At the conclusion of the account of the second stage, the subject of tubercle in the human lung is introduced as necessary to render the account of the stage of softening intelligible. A tubercle, when full grown, is described as consisting of "a small, rounded tumour, made up of one or more giant cells, from which multiple fibrous processes radiate, and constitute a reticular fibrous tissue." The author "looks upon the greater number of the lymphoid and other small cells found within a tubercle as endothelial in their nature, and as in reality representing the connective-tissue corpuscles of the fibrous reticulum on which, or within which, they lie." He further states that we have "in the histological composition of tubercle a sure method of diagnosing those tumours which are tubercular, and of rejecting those which, although they may resemble tubercle in their gross characters, nevertheless prove to be totally different in their nature when more minutely examined."

The conclusions reached in regard to the significance of tubercle are :—

1st. That it is merely a form of connective tissue growth.

2d. That it is caused by an irritant acting upon the connective tissue, probably of the nature of a ferment, produced in the softening of a caseous mass.

3d. That this is carried embolically into different parts of the organ, and stimulates them locally.

4th. That the tubercle at first has a close resemblance to a sarcoma, but that, when the irritation has subsided, the connective-tissue elements organize, and give rise to fibrous tissue.

5th. That the ultimate destiny of the tubercule-nodule is to produce a small fibrous tumour.

6th. That the presence of the giant cells is merely an evidence of the return of the irritative connective-tissue elements to their embryonic type.

As to the etiology of tubercle, the author's theory is that of Buhl; as to its clinical relations his views closely follow the teachings of Niemeyer. Where the caseous focus of infection is in some distant point or organ, and tubercles are found without other lesions in the lung, they are designated as "primary tubercle of the lung;" when the caseous source of infection, and the tubercular nodules to which it gives rise are found together in the lung, the latter is designated "secondary tubercle of the lung."

The two main causes of such local infecting caseous centres in the lung are interstitial pneumonia or cirrhosis with bronchiectatis, and catarrhal pneumonia in the third stage. Both of these are accompanied by the development of secondary tubercles, but as they are more abundant and less obscured by complications in the former than in the latter, the author selects for special consideration the tubercular deposits of interstitial pneumonia. A minute study of the development of tubercle is followed by a discussion of the degeneration of the new growth. The commonest form is caseation. The close analogy between the caseation of tubercular deposits and of gummata is pointed out. Softening begins in the centre, absorption takes place, the cicatricial tissue surrounding the tumour contracts, and prevents the formation of a cavity.

The second form of degeneration is fibrous, not regarded in fact by the author as a degeneration at all, seeing that it is the ultimate stage of development in tubercular nodules.

The consideration of the third stage of catarrhal pneumonia completes the subject. There is, however, further described an unusual form of disseminated catarrhal pneumonia in which the lung is found after death to be diffusely studded with minute grayish nodules closely resembling tubercles, and often mistaken for them. These grayish masses are often yellowish in the centre, and altogether lack the histological structure of tubercle. They are in fact small isolated groups of air vesicles, filled with epithelial products, the group invariably caseating in the centre. The difference between this and ordinary catarrhal pneumonia in the second stage consists in the small size of the nodules, their isolated character, and their universal diffusion throughout the lung substance.

Finally, the concluding pages are devoted to "the supposed contagiosity of tuberculosis and pulmonary phthisis." The famous paper of Robert Koch in the *Berlinischer Klinische Wochenschrift*, No. 15, April 10, 1882, is reviewed at length. Even the allusion to "royalty itself" which caused a smile in one of our local societies, shortly afterwards, is reechoed from the shores of Scotland.

The conclusions as to the causative relations between the tubercle bacillus of Koch and pulmonary phthisis, which are, as we infer from current medical literature, being accepted widely by the profession, are according to the author not proven, and indeed illogical. Certain of Koch's conclusions are characterized as faulty, and extremely misleading, notably that which makes the presence of the tubercle bacillus a criterion of tubercle.

The following conclusions are set forth as all that the recognized facts will warrant:—

1. Catarrhal pneumonia is a disease resulting from various causes acting as irritants upon the air-vesicles and small bronchi. There is not the slightest evidence to show that the tubercle bacillus floating about in the atmosphere is one of these.

2. The catarrhal products are liable to caseate in certain subjects, particularly those of a strumous constitution.

3. When they caseate, there sometimes grows upon the caseous part a bacterium, which, if absorbed by the bloodvessels or lymphatics, is capable of irritating the tissues in which it becomes implanted, and forming a little fibrous hyperplasia. This body and no other is a tubercle.

4. Other caseous masses throughout the body, more especially those connected directly by means of lymph channels with a source of septic infection, act as the means of cultivation. They are, particularly, strumous glands or abscesses which have opened externally, bronchiectatic cavities, caseous bronchial and mesenteric glands, and the strumous testicle where a sinus has existed.

5. These facts and many others seem to warrant the conclusion that the tubercle bacterium is originally allied if not similar to that found in putrefactive wounds, but has become specially modified by being cultivated on a caseous basis, so that when absorbed, instead of causing a slough of the tissue by its virulence, it merely irritates the tissue into forming a little cicatricial tumour. Tuberculosis and pyæmia, as Sanderson long ago pointed out, have therefore the closest relationship.

6. The tubercle poison, like the pyæmic, differs from that of syphilis

and glanders in being generated *de novo* in a necrotic caseous tissue. That of syphilis and of glanders is propagated by contagion.

7. When once engendered the tubercle poison can be transmitted from host to host by inoculation.

8. The reason of certain caseous tissues throughout the body not propagating a tubercular eruption, is that by their position they are protected from extraneous contamination.

The question as to the heredity of phthisis is very ably discussed. Dr. Hamilton's views are, in fact, based upon, and are nearly identical with those of Virchow and Niemeyer. He sufficiently disproves the hereditary character of catarrhal pneumonia, and the affections which make up the group included under the term "phthisis," except in so far as they have their origin in a hereditarily transmissible delicate habit of body, accompanied by abnormal sensitiveness of the epithelium of the respiratory tract to outward impressions. He lays properly great stress upon the fact that catarrhal pneumonia is not a constitutional affection at first, and that it is only after caseation, and then perhaps only because the caseous masses become septic by the growth upon them of a special bacterium, that it becomes constitutional.

The inherent difficulties that beset the subject of the pathology of the wasting diseases of the lung are increased by the present modes of investigation. The worker in the laboratory, the histologist, or the mycologist properly so called, is too often without clinical training or experience of any kind, whilst the years of work at the bedside or in the consulting-room that bring close knowledge and wide views of the natural history of disease enforce at the best a second-hand acquaintance with the facts of normal and morbid histology. Specialism in medicine has done and is doing work that without it would be impossible. But specialism has been truly called "a morbid tendency of our times." We must await, for the solution of many urgent problems in pathology, the day when the work of the laboratory and that of the clinic, instead of occupying parallel, and therefore always sundered planes, are brought into harmony. This statement is especially true of the whole subject of phthisis and tuberculosis.

The text is made clear by sixty-five cuts, which, though drawn from specimens and with the amplification given, are sufficiently schematic.

J. C. W.

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ART. XVI.—1. "*La Prima Ovariotomia in Italia, nel* 1815." *The First Ovariotomy in Italy, in* 1815. 8vo. pp. 16. Carignola, 1882.

2. "*La Quarta Centuria d'Ovariotomie in Italia.*" *The Fourth Hundred of Italian Ovariotomies.* By Dr. DOMENICO PERUZZI, of Lugo, Italy. 8vo. pp. 10. From the *Raccoglitore Medico*, of Forli, 1883, series iv. vol. xx. p. 173.

1. THE reliable modern history of Ovariotomy at least for cystoma is now generally admitted to date from December 1809, when Dr. Ephraim McDowell, of Danville, Kentucky, performed the world-renowned operation upon Mrs. Crawford, making a long incision in the side of the abdomen, evacuating the cyst by the knife before removing it, and saving the life of the patient. The date of his second operation is not upon record.

His third was performed in May or June, 1816, prior to which, it is claimed in the pamphlet under review, that a diseased (non-cystic) ovary was removed in Italy, and for the first time in Europe.

That the entire ovary was removed prior to 1809, in some of the operations in which the cyst was evacuated by incision and the wound kept open so as to form a fistula for drainage, is highly probable, as with the evacuation of the fluid, long membranous shreds were in exceptional cases drawn out, and a permanent cure resulted. The often-mentioned Laumonier operation, performed in the hospital of Rouen, France, on January 5, 1782, approaches in character a modern ovariotomy, but was in fact a combination of the older method by incision and drainage, and the new one by extirpation. The subject, Marie Louise Lagrange, was a prostitute of twenty-one years of age, who, after bearing a child, became affected by an abscess which opened into the vagina, and could be made to discharge more rapidly under pressure upon the abdomen, which appeared to contain a tumour. When opened by incision, to the extent of four inches along the lower edge of the external oblique, a scirrhous ovarian tumour the size of a hen's egg was found, together with an abscess communicating with the Fallopian tube; this latter when opened discharged a pint of pus. The ovary was torn from its attachments to the tube, and removed without ligation; the abscess cavity was stuffed with lint, and the external wound left open for drainage. Suppuration ceased on the twentieth day, and the woman was discharged well in forty-six days. This operation has been asserted not to have been an ovariotomy, but it is evident that an ovary or a morbid growth mistaken for it must have been removed, although the abscess cyst was not extirpated, as it would be under the present method of operating.

*Was the Italian operation in question a true ovariotomy?* Having access to the requisite authorities we are prepared to investigate the claim made in Italy, and very strongly advocated to the reviewer by Dr. Peruzzi, of Lugo. The report of the case was read before the Medico-Chirurgical Society of Bologna on November 10, 1843; the tumour removed was presented as an alcoholic preparation to the Society, where it is still preserved; and the account was published in the *Bulletino delle Scienze Mediche di Bologna*, series iii. vol. iv. page 332, 1843. The pamphlet under review contains this report; the remarks made by Mr. T. Spencer Wells (translated into Italian) upon the operation in question, published in the *British Med. Journ.* of March 16, 1876, page 363, and November 23, 1878, page 762, together with comments upon the whole in manuscript, by Dr. Domenico Peruzzi, of Lugo, who has long been interested in establishing the claim of the operator, and his own country, to precedence in ovariotomy in Europe. Having a warm personal friendship for the claimant, and a feeling of professional interest in Italy, the reviewer is disposed to grant every possible advantage in examining the subject, while at the same time being careful to be impartial in so doing.

The operator in the case was Prof. Gaetano Emiliani, of Faenza, and the recorder of it, his son, Dr. Emilio Emiliani, of the same city; and although not reported until twenty-eight years had elapsed, the patient and all the persons present at the operation were still living except the operator himself.

The subject of the operation was Rosalia Ghetti, of Faenza, aged 26 years, the wife of a baker, of lymphatic temperament, and the mother of three children, only one of which, an infant, was still living. Receiving

an injury in the abdomen from the edge of a pan of water, she was obliged to call in her physician, who detected a tumour, then quite painful to the touch, in the left inguinal region. Finding evidences of local peritonitis she was treated accordingly, but the tumour still remained. At the end of four months she thought herself pregnant, and two months later discharged a large mole, with a considerable loss of blood. As her disease advanced she became feverish, and numerous evidences of constitutional derangement appeared. At this stage Dr. Emiliani was called in consultation, and found the patient suffering with fever, remitting with attacks of chills, every night, affecting more especially the lower extremities and feet. She had a dry mouth; thirst; a coated tongue; constipation of the bowels; and morbid wakefulness. Dr. Emiliani confirmed the opinion of Dr. Brunetti as to the presence of a tumour, and this was decided to be an enlargement of the left ovary. It was hard, spheroidal, circumscribed, and not very sensitive; and was thought to be of a scirrhous character, and possibly a cancer, and they decided on its extirpation.

There were present at the operation Dr. Girolamo Brunetti, the physician of the family; Sig. Antonio Bucci, phlebotomist; and some friends of the patient, together with the operator. Dr. Emiliani made his incision about two and a half inches in length along the linea alba, and not in the side of the abdomen as was done in the first and second cases of Dr. McDowell. When the peritoneal cavity was opened the tumour was found, which from its position, form, and connections was decided to be an enlarged left ovary. This was hard, and had its superior portion studded with cysts, which when incised gave exit to a fetid ichor; this body was adherent by all its lower portion to the colon. The adhesions of the tumour were broken up, and its arterial connections tied by degrees and then severed. The amount of blood lost was estimated to have been about half a pound. The abdominal wound was closed by one suture, and dressed with linen spread with ointment, over which were placed a compress and bandage. By the third day, when the first dressing was replaced, the wound was found nearly cicatrized, and on the eleventh day the woman was virtually well.

*Subsequent History.*—In about a year after her recovery the patient gave birth to twins, a boy and girl, who only lived a few hours; then in time to another girl; afterward to a boy who died in infancy; then another boy, who perished in his youth from scrofula; in all five. The mother with two of her daughters was alive and well at the time the report was read, in 1843. At this time the tumour, which had been twenty-eight years in alcohol, was of a pyriform shape, and measured $3\frac{1}{2}$ inches in length by 2 in thickness.

*Examination of the Specimen.*—At the suggestion of Mr. T. Spencer Wells, of London, who was anxious to give due credit to Italy, the tumour was subjected to a careful microscopical examination, under Prof. L. Ranvier, of Paris, in September, 1878, the morbid growth having been brought for the purpose by Dr. Peruzzi, before mentioned. There were present at this investigation of the nature of the tumour, Dr. J. Marion Sims, of New York, Dr. Peruzzi, Prof. Ranvier, and Mr. Spencer Wells. Prof. Ranvier, after describing the method of preparing his sections, says: "In the sections made we discover only fibrous tissue and bloodvessels. The fibrous tissue is characterized by the connective fasciculi, interlaced in different directions, and by connective cells. The arteries are distinguishable by their muscular coat, which is well preserved. The veins

and capillaries are dilated and filled with blood; the red and white globules are still recognizable, which shows that the preservation of the tumour is relatively good. In none of the preparations that I have made are there either glandular channels, cysts, or Graafian follicles; still, it might be possible that the morbid tissue had originated in the ovary; but it would be necessary then to admit, which is not improbable, that it had effected a complete disappearance of the characteristic elements of this organ."

*Was this Organ, then, an Ovary, or not?*—This, in the judgment of the reviewer, can never be positively determined. Prof. Emiliani and his son evidently believed that the tumour was ovarian, from its anatomical relations; but there was nothing in proof of this elicited under the microscope. It is true that the specimen had been very long kept; but still not too long to distinguish arteries, veins, capillaries, white and red blood disks, muscular fibre, and fibrous and connective tissues. It is evident then that no ovarian stroma was found, for the sole reason that it did not exist in the tumour. The growth was fibrous only. If it is possible for an ovary to undergo such a vital change from disease, then this may have been originally ovarian in character. But such a total transformation is not in accordance with microscopical experience. We must either suppose that the ovary never had a proper elementary organization, or that the morbid growth grew from, but was not a part of, the ovary.

Ovariotomy as a surgical term has at the present time somewhat of a special meaning. When we speak of the operation having been performed upon a patient, without specially defining the character of the growth, the natural inference is that the patient was affected with a cystic degeneration of the organ. When the ovary has been but slightly changed in appearance by disease, or only moderately enlarged, its removal is known as a Battey's operation, or an *oöphorectomy*. A few well-known operators are now advocating the removal of diseased ovaria in their early stage of enlargement, and especially when affected with *cystoma*. This would constitute a somewhat intermediate operation, the fatality of which cannot be predicated upon the known results of the removal at an advanced stage. Prof. Emiliani removed a small pear-shaped, solid tumour, one end of which contained puriform matter, which he believed at the time to be an ovary. If it was not ovarian, the risk of the operation was the same; it was not any less difficult of performance; but there is a technical distinction to be considered when we come to settle the question of priority in ovariotomy among the countries of Europe. All credit is due the Italian surgeon for his boldness and success, but there must always be a doubt as to his having really extirpated an ovary in 1815.

The question of priority in Europe does not lie between Dr. Emiliani and Mr. John Lizars, of Edinburgh, as Dr. Peruzzi appears to have supposed. Mr. Lizars extirpated an ovary with success on February 27, 1825, but was antedated some years by Dr. Chrysmar, of Isny, in southwestern Germany. Dr. Hopfer, of Biberach, for a time Medical Superintendent of the upper district of Swabia, met Dr. Chrysmar in 1819, and was present at his third and fifth ovariotomies, the first of these on May 16, 1819, and the second (his fifth) in August, 1820.[1] In reporting his third, fourth, and fifth operations, *Dr. Hopfer writes that Dr. Chrysmar told him that, previous to his acquaintance with him in* 1819, "*he had*

[1] London Med. Gazette, Feb. 1829, from Graefe and Walther's Journ. vol. xii.

*twice performed the operation of extirpating a diseased ovarium, and in one of these instances with success.*" This gives Chrysmar five cases instead of three, with which he is usually credited, and two of them saved. Dr. Chrysmar was a graduate of Vienna, had a private hospital, enjoyed a great reputation as an operator over a large extent of country, and died in 1821, aged 47. In the three cases reported, the tumours were solid, and weighed in order $7\frac{1}{2}$, 8, and $6\frac{1}{2}$ pounds. In the third of the five the tumour was adherent to the transverse and descending colon, greater curvature of the stomach, and parietal peritoneum. The eight-pound tumour was fibrous, and the patient was alive and well eight years after its removal. As Dr. Chrysmar did not report his operations, it is impossible now to say how early he may have removed a diseased ovary. There are reasons, however, for the belief of some writers that there were unreported ovariotomies prior to those now on record, and that it is impossible to say who in Europe was the earliest operator. Such is not the case, however, with regard to the United States, and credit is due in a special sense to Dr. Ephraim McDowell over any one that may possibly have antedated him in Europe, from the fact that he designed to remove an ovarian cyst, and undertook the operation for this avowed purpose, having made a correct diagnosis before resorting to the use of the knife.

2. In the January number of this Journal for 1881, we presented an account of the first and second hundred of Italian ovariotomies, and in the October number of 1882, the third hundred. We have now to review the record which contains the fourth hundred, and give a *résumé* of the results in the whole four hundred.

The fourth hundred, as we anticipated, covered a less period of time, and had a lower rate of mortality than the third. The first hundred commenced with March 26, 1859, and covered a period of 18 years and 3 months. The second hundred were performed in 2 years and 7 months, or a little less than one-seventh of the time: the third in one year and eleven months; and the fourth in eleven months.

The improvement in the results of the operations has been very marked and encouraging. Of the first hundred only 37 were saved. In the second hundred the percentage increased to 64; in the third to 74; and in the fourth to 79.

Dr. Domenico Peruzzi stands at the head of Italian ovariotomists in the number of his operations, his record being 31, counting one Battey case. The chief operators in the record of the four hundred rank as follows:—

| | Operations. | Cured. | Died. |
|---|---|---|---|
| Dr. Peruzzi, Lugo . . . . . | 31 | 21 | 10 |
| Prof. Marzolo, Padua . . . . . | 23 | 10 | 13 |
| Prof. D'Antona, Naples . . . . | 21 | 17 | 4 |
| Prof. Ruggi, Bologna . . . . | 14 | 8 | 6 |
| Dr. Franzolini, Udine . . . . | 12 | 8 | 4 |
| Dr. Frattina, Pordenone . . . . | 12 | 7 | 5 |
| Dr. Borsini, Piacenza . . . . | 10 | 8 | 2 |
| Prof. Chiara, Florence . . . . | 10 | 8 | 2 |
| Prof. Cosentino, Palermo . . . . | 10 | 9 | 1 |
| Dr. Margary, Turin . . . . . | 9 | 6 | 3 |

*Total* Operators, 10 *Total* Women saved, 102
Operations, 152 " lost, 50

Percentage saved, $67\frac{4}{19}$.

Of the fourth hundred, Peruzzi saved 3 out of 5, one of the former a Battey case. Prof. D'Antona saved 12 out of 13, or $92\frac{4}{13}$ per cent. Prof.

Inzani, of Parma, saved all his, 4; Prof. Chiara, 5 out of 7; Prof. Cosentino, 7 out of 8; Prof. Tibone, of Turin, and Porro, of Milan, each 3, all of their cases; and Drs. Frattina and Borsini, each 2 out of 3, *i. e.*, 41 out of 49, or over 83 per cent. collectively, by nine operators.

The following classified table shows the results of the ovariotomies, and some other forms of abdominal operations upon women, in the periods covered by the four reports respectively:—

| | Total. | Cured. | Died. |
|---|---|---|---|
| 1st report. | | | |
| 1. Ovariotomies | 100 | 37 | 63 |
| 2. Ovariotomies, partial or incomplete | 7 | 0 | 7 |
| 3. Laparo-hysterectomies (supra-vaginal). Laparotomies with extirpation of peri-uterine tumours or other viscera | 13 | 3 | 10 |
| 4. Exploratory Laparotomies | 7 | 4 | 3 |
| 2d report. | | | |
| 1. Ovariotomies | 100 | 64 | 36 |
| 2. Ovariotomies, partial or incomplete | 2 | 0 | 2 |
| 3. Supra-vaginal Laparo-hysterectomies | 7 | 2 | 5 |
| 4. Exploratory Laparotomies | 1 | 0 | 1 |
| 3d report. | | | |
| 1. Ovariotomies | 100 | 74 | 26 |
| 2. Ovariotomies, partial or incomplete | 9 | 5 | 4 |
| 3. Supra-vaginal Laparo-hysterectomies | 27 | 7 | 20 |
| 4. Exploratory Laparotomies | 0 | 0 | 0 |
| 4th report. | | | |
| 1. Ovariotomies | 100[1] | 79[1] | 21 |
| 2. Ovariotomies, partial incomplete | 7 | 4 | 3 |
| 3. Supra-vaginal Laparo-hysterectomies | 19 | 9 | 10 |
| 4. Exploratory Laparotomies | 6 | 5 | 1 |

The first and second reports have very complete tabular records arranged chronologically, and in nine columns, and it is much to be regretted that the others have not entered more into the particulars of the cases. In the 1st and 2d we have "*the operator, locality, date, age, social state, adhesions, treatment of pedicle, dressing, nature and weight of tumour, result, cause of death, and other notices.*" In the 2d and 3d all these are left out, but the name of the operator, locality and result and the cases are all presented in their totality for each operator. This has largely simplified the record, but has at the same time injured its value very materially as a means of instruction, in regard to the causes of success and failure in each individual case. The Italian record was of much value in showing the results of ovariotomy in general practice, and the diminishing mortality under new and improved methods of treatment, until the full table was dropped; since which we have only the improved results, with no minutiæ on which to found them. It is to be hoped that Dr. Peruzzi's fifth hundred will be given in the tabular form of the first and second.

The most frequent causes of death in the last hundred ovariotomies were septicæmia, shock, acute peritonitis and hemorrhage. Double ovariotomies were performed in three cases: one by Dr. Truzzi, of Milan, case cured; one by Prof. Mangiagalli, of Sassari, Island of Sardinia, cured; and one by Dr. Frattina, of Pordenone, case lost. In one ovariotomy performed by Dr. Casati, of Forli, the case was complicated by pregnancy; still the patient recovered.

[1] 4 Battey operations, with 3 recoveries, are included in this record.

*Battey Operations in Italy.*—Six of this type of ovarian extirpation have been reported, with four recoveries. Case 1. Operation by Dr. De Cristoforis, of Milan; woman died of hemorrhage from one of the pedicles. 2. Dr. Franzolini, of Udine, patient cured. 3. Dr. Peruzzi, of Lugo, August 10, 1882; disease hystero-epilepsy; patient improved. 4. Dr. De Gaudenzi, of Vercelli, September 24, 1882; case, one of large *fibro-myoma uteri*, complicated with ascites; only one ovary found. Patient recovered, and tumour became atrophied. 5. Dr. Vecelli, of Venice, December 5, 1882, practised ovaro-salpingotomy of Tait, in a case of nymphomania, with entire success. 6. Dr. Giovannini, of Sant Arcangelo, December, 1882; case was one of uterine fibroma, with hemorrhage. Woman died in four days of septicæmia.

But for the fact that the Battey operations of Italy have been quite as fatal as the ordinary ovariotomies, we should object decidedly to their being placed in the same table. As it is, we believe it more fair to keep them separate in calculating the mortality of ovariotomy. We do not see why "the partial or incomplete ovariotomies" should be excluded in the enumeration. These cases add 25 to the 400, and 16 of them fatal. It is correct to exclude exploratory incisions; but it is questionable whether we ought not to count all the incomplete operations, made such by extensive adhesions, or by errors in diagnosis. Excluding the four Battey cases from the fourth hundred, and adding the 7 incomplete cases, we have 103 operations, with 80 recoveries, and 23 deaths, which gives a recovery of about $78\frac{9}{10}$ per cent., a marvellously good result, if all the cases of Italy are included in the record, when we consider that there were 49 operators in charge of the 103 patients, instead of one, or a few experienced surgeons.

R. P. H.

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ART. XVII.—*Photo-Micrographs and how to make them, Illustrated by Forty-seven Photographs of Microscopic Objects, Photo-Micrographs, reproduced by the Heliotype Process.* By GEORGE M. STERNBERG, M.D., F.R.M.S., Major and Surgeon, United States Army, etc. 8vo. pp. 204. Boston: James R. Osgood & Co., 1883.

THE recent *renaissance* in amateur photography has created an especially opportune moment for the appearance of a full and reliable guide on the above fascinating subject, for who has microscope and camera without attempting to record on the sensitive plate the wonders of a hidden world? How far this want is met by the volume before us, is largely dependent upon the experience of the reader in this special line of work. To those anticipating a first trial in this direction, and entirely ignorant of the necessary details, the elementary instructions will be of great service; to those who have engaged in photo-micrography with any degree of success we doubt if the book in question offers much additional information, and but few novelties. We confess to a sense of disappointment on finishing the scant half of the volume devoted to the subject proper: the anticipations of valuable hints, from the extended experience of one so constantly engaged in photo-micrography as has been the author, have not been realized. With the unequalled work of the master-hand before us, it is indeed a task of difficulty to supplement and improve upon familiar methods,

where sunlight is employed. Dr. Sternberg has added little of value to the already well-known methods of Dr. Woodward.

Misconceptions regarding photo-micrographs are so widely spread that a few paragraphs found in the introduction are well worth presenting: the first two will answer a common inquiry.

"*Photo-micrographs* are sun-pictures of microscopic objects more or less magnified.

A *micro-photograph* is a microscopic picture of an object which can be seen by the naked eye. . . . Sun-pictures, as compared with hand-work, have the advantage of being quickly made, and of being absolutely true to nature. . . . By photography, the most delicate lines or shades are preserved, and one who has no skill in drawing is able to make a permanent record of what he sees in the course of his microscopical researches. That is, *within certain limits*, for not every microscopic object is suited for photography; and those who imagine that it will be a very simple matter to make photographs of all objects in their collection . . . . are doomed to disappointment. Candor compels the admission that very many objects which seen under the microscope are very beautiful, cannot be successfully photographed. This is true of a majority of histological and pathological preparations not mounted especially for this purpose. It is true, as regards opaque objects, and objects of a deep-red, yellow, orange, or brown colour, as these are practically opaque for actinic rays. In short success in photo-micrography depends to a considerable extent upon the selection of suitable objects, and upon mounting these in the best manner for the purpose in view."

Within the last half dozen sentences are expressed the gist of photo-micrography, a disregard for which causes so much of the disappointment incident to this work. For successful photographs, objects *must be suitable*, and for powers over one hundred diameters, all parts of the object must be within the same plane; this is especially true of animal tissues of which the sections must be of the greatest tenuity, embracing absolutely little more than a single layer of elements. But success—especially true of histological subjects—depends upon suitable staining as well as upon evenness, *differentiation* being a quality of the greatest importance; we believe the experience of many regarding carmine is quite different from the views expressed, since well differentiated carmine specimens are usually among those yielding the best results: in fact, *contrast* is practically more important than colour, deeply stained silver preparations frequently yielding excellent pictures by both sun and artificial light.

The author wisely suggests to the beginner, that a first attempt be made with low powers, and the simplest conditions of illumination, as with light reflected from blue sky directly through the object without the intervention of any condenser, the microscope and camera being, however, inclined eight or ten degrees from horizontal to obtain uninterrupted rays from the clear sky.

Just here the opportunity of adding really valuable new matter, such as would have been appreciated by the majority of those attempting this modification of photography at present, has been ignored by the author confining his instructions so closely to work by sunlight. Nine out of every ten who begin photo-micrography will prefer, results being equal, to devote the leisure of the evening rather than encroach upon the busy hours of the day. Had our author devoted enough time to the results obtainable by simple lamplight to develop its capabilities, and then fully recorded his experience in the present pages, he would have added matter of service to the majority of amateur workers. For the specialist whose almost daily needs require photography, especially with high amplifica-

tions, sunlight is undoubtedly to be preferred, but to the amateur, for whose instruction this book seems to have been especially written, lamplight recommends itself by the simplicity and ease with which it may be employed—the results, with ordinary lenses and moderate amplification, being almost, if not fully, equal to those obtained by sunlight, as is testified to by a host of excellent negatives, and the experience of now many workers.

For the higher powers—five hundred diameters and upward—work by daylight without a heliostat is at best tedious and unsatisfactory, as is admitted by our author himself, where for an amplification of six hundred diam., with a Zeiss $\frac{1}{18}$ oil immersion, half an hour was required as an exposure with an instantaneous plate; with Zeiss $\frac{1}{12}$ oil immersion and amplifier, giving a magnification of over twelve hundred diam., on a plate by no means instantaneous, fifteen minutes sufficed to produce an excellent negative of Podura, with the illumination from a small flamed oil lamp—the rays passing through a bull's-eye and achromatic condensers. For convenience and best results in working by sunlight, for powers over three hundred diam., a heliostat is almost indispensable; to obtain the latter and the necessary accessory apparatus requires some considerable pecuniary outlay; to manage the light so obtained to the best advantage requires nicety of manipulation. It may be remarked, that in making the photographs illustrating the book, Dr. Sternberg has invariably employed the heliostat when the amplification desirable was over two hundred diameters. We reiterate, then, as the conclusions from an experience of considerable extent with both sunlight and heliostat, and lamplight, that for moderate powers, say up to two hundred and fifty diam., the capabilities of lamplight equal those of sunlight; that for higher powers, sunlight possesses decided advantages, but can only be utilized with satisfaction when a heliostat or a substitute is employed; that when direct sunlight is not employed for high powers, as good results may be obtained more readily with lamplight than with diffused sunlight.

The statement that required amplification should always be obtained with the lowest lens possible, removing the plate to a greater distance—even to eight or ten feet—rather than employ a higher objective, should, perhaps, be qualified by a regard for the character of both the object to be photographed, and of the lens used, since an objective under such conditions may fail entirely to show minute details of structure, which are clearly brought out by a lower amplification when a higher glass possessing greater powers of resolution is employed.

The arrangement for focusing described by the author, by means of cords passing over the adjustment wheels, with counterpoising weights attached, possesses decided advantages over the expensive and cumbersome appliance formerly used by many after the apparatus of the Army Medical Museum. This device for moving the fine adjustment was employed by the reviewer five years ago, and ever since has given perfect satisfaction; he can add his testimony to that of Dr. Sternberg regarding its perfectly delicate and accurate working: it seems, as frequently occurs, the same device for overcoming the difficulties and annoyance incident to the more complicated and expensive arrangement was contrived independently by two workers. The necessity of applying a cord to the coarse adjustment will not be felt by those who prefer to keep the focusing screen within four or five feet of the object, since, by having a mirror properly placed at the end of the board supporting the apparatus, the ground-glass of the

camera is clearly seen, a matter of great advantage when arranging illumination and hunting fields without uncoupling the camera and microscope, which is especially desirable when there is danger of disturbing the object. By a hand-mirror held near the ground-glass, approximate focusing may readily be accomplished while the operator is stationed at the microscope.

Our author having had experience chiefly with central light, photography by oblique illumination is not discussed. The advice to those purposing a trial in this more difficult field to procure Woodward's "oblique illuminator" may be supplemented by the recommendation rather to seek the aid of one of the recent wide-angled *immersion condensers*, which furnish light of the greatest obliquity, while possessing the great advantages of being readily manipulated and of furnishing central light at a moment's notice by simply turning a collar or milled head, an advantage which only those engaged in work over the severest tests will fully appreciate. The sections on "Black-Ground Illumination" and "Reflected Light" are interesting, the experiments being illustrated by photographs found in the latter part of the book.

While discussing the arrangements and fixtures where a darkened room constitutes the camera-box—a plan of work, by the way, which certainly, for the majority of workers, is less convenient than with the ordinary camera—Dr. Sternberg justly calls attention to the admirable views of microscopic objects, which may be had by receiving the image on a white screen. It may be added that, by the slight modification of such a "Solar Microscope," by placing a mirror in the path of the rays from the instrument they may be reflected to the drawing-board, when with the greatest ease and accuracy a faithful sketch may be made. In practice, the reviewer employs for such purpose a circular mirror of fine quality, the image of whose form readily announces distorted reflections on account of improper angle, as, when properly adjusted, the reflected field should be a true illuminated circle.

Within the next half dozen sections, the various manipulations incident to making the negative will be found, including the chemical processes of the dark-room, to which is added a section on making positives on glass for use in the lantern. While fully appreciating the impossibility of giving exact figures, yet the work of the beginner would be much facilitated by more extended and closer data regarding length of exposure; without being committal, it would have been desirable to state the average length of exposure, *under certain definite conditions of illumination*, for the lenses of the various usual focal lengths. The formula for the ferrous-oxalate developer would be improved by the usual addition of citric or oxalic acid to the oxalate solution, and sulphuric acid to that of the iron.

The last twenty-five pages of the book proper are devoted to "Selection and Preparation of Objects from Photography," under which heading are briefly considered a number of unicellular organisms, infusoria, spores, animal cells, including blood-corpuscles, vegetable tissues, diatoms, insects, and, lastly, animal histology and pathology, regarding which latter our author confesses to have given but little time, having devoted his attention "mostly to photographing unicellular organisms, and especially to the Bacteria."

The remaining pages of the book—almost a hundred—are placed at the disposal of the more or less extended and popular descriptions of the accompanying forty-seven heliotype reproductions of the photo-micrographs,

embracing a variety of objects, as well as illustrating the results obtained by the methods of work described in the previous text. The figures range in amplification from 12 to 1450 diameters; in objectives, from the 2 inch to the $\frac{1}{18}$; in quality, from excellent to execrably bad. In turning over these, one notes the quite disproportional excellence of a certain class of objects—bacteria and bloods; the explanation, however, the author himself supplies by stating that these have claimed his special attention. The photographs of blood and of *Navicula Lyra* are really fine, and deserve generous praise; the remaining plates are of varying degrees of excellence, among the better being, naturally, those of the diatomaceæ by central light, particularly the square of Möller's *Typen-Platte*, and *Triceratium Flavus;* plate IV. is decidedly the worst in the book—the photograph of Podura scale being little better than a caricature.

The wisdom of allotting so many pages to popular descriptions, which, from the premises, must be very incomplete, and but partially satisfactory, admits of question; however, the desire to interest and demonstrate to popular readers biological facts, influenced, no doubt, the author in his decision: the especial truth in view was "that the lowest living things are unicellular organisms, and that the tissues of the higher plants and animals are made up of cells,"

While the generous distributions of space in margin and type are, probably, features desirable in the book as a candidate for popular favour, a closer economy of space would certainly render the volume more acceptable considered as a scientific contribution. In conclusion, we repeat, for beginners who propose to work by daylight, that the book will undoubtedly form a very valuable source of information and assistance; those already practically familiar with the instructions of Dr. Woodward will, probably, on the whole, find little to induce a change in their methods.

G. A. P.

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Art. XVIII.—*Traité Clinique et Pratique des Maladies du Cœur et de la Crosse de l'Aorte.* Par MICHEL PETER, Professeur à la Faculté de Médecine de Paris, etc. Tome I. 8vo. pp. 844. Paris, Baillière et Fils, 1883.

ALREADY Michel Peter has become favourably known to American readers by a late edition, the sixth, of the admirable clinical lectures of Trousseau. Further, he has himself given us an insight into his peculiar ideas and special line of work by a treatise in two volumes of Medical Clinic, which even now has reached a third edition.

We are well prepared, therefore, to peruse with interest an exhaustive book from his pen, on the practical and bedside aspects of diseases of the heart, and of the arch of the aorta. While he professes in his preface to have borrowed explanations from anatomy and physiology, wherever he has been able to give greater precision and clearness to our knowledge of the diseases which he treats, he disclaims entirely those hazardous analogies from experiments on animals which are far from lending additional proof to the observation or interpretation of new facts. He directs the attention of his readers particularly to the consideration of those chapters in his work in which he claims to have elaborated fresh opinions, and trusts modestly

that the fruit of long meditation and research may prove to be of material advantage to those who follow him in a similar line of study.

After this introductory chapter, we have the first part of the volume, which is by far the longest as it should be (760 pages), devoted to diseases of the heart. The first forty-eight pages are divided into four chapters, which are taken up with some general anatomical and physiological views, with the anatomical and clinical aspects of the heart, the different methods of physical exploration, and the general notion of the pathogeny of the heart. In regard to the clinical examination of the heart, the author lays much stress upon pains, both spontaneous and provoked, which are deep-seated in the precordial region, which indicate surely an inflammation of the cardiac muscular structure, and which should not be considered, at least those produced by pressure in the fourth, fifth, and sixth left intercostal spaces, as at all evidence of ordinary intercostal neuralgia. We confess to the feeling that the author's clinical acumen has gone a step too far, and that he is developing with too great force a view which most observers will not find justified in their experience. It is true that there is frequently a sensation of vague pain in the interspaces of the precordial region when the heart structures are inflamed, either in acute or chronic disease, but usually these pains very closely resemble the myalgic pains of other muscles, which are unquestionably rheumatic in character and not seated in one of the underlying viscera.

Nor does the author stop with his interpretation of localized pains which are, according to him, in the cardiac fibre itself. He can distinguish by pressure in a certain point of the third intercostal space to the left, corresponding with the auriculo-ventricular sulcus, that the ganglion of Remak is morbidly deranged! Peter's clinical researches in this direction also take in the immediate effects of pressure over the cardiac plexus (disease of the aorta), the pneumogastric nerves, the phrenic nerves (angina). In acute myocarditis and pericarditis there is usually a local elevation of temperature of half a degree or more, which can be discovered by pressing the bulb of the thermometer over the third and fourth left intercostal spaces, one centimeter from the margin of the sternum (p. 43).

In a very graphic manner Peter directs attention to what he believes to be the false views of those writers who, hitherto in France, notably, have bestowed too great importance upon the mere existence of a lesion of valve, or orifice with its concomitant pathognomonic murmur. The study of the future, he writes, should be devoted more exclusively to the dynamic properties of the cardiac muscle and the nerves which control it. How often are these diseased, and yet how imperfectly studied and how little understood! We regret that in this place the author should not make mention of what others have done; for surely nothing in cardiac literature can be more delightful reading to the clinician than much that has been studied so carefully in this way by Da Costa and Allbutt, Flint and Fothergill, not to mention the learned articles from well-known German writers (Friedreich, Duchek, Wunderlich).

In section first, diseases of the pericardium are very thoroughly studied. In the article on the acute forms of pericarditis several good wood-cuts are inserted, and serve to illustrate the text. Although a large amount of the material which the author employs to give value to his affirmations is evidently drawn from his own cases, he does not hesitate to uphold his views by frequent citations from others. We are glad to note the value which is attached to the faithful work of the honoured Sibson, but are pained by

the general pervading tone of egotism which is betrayed whenever claim is made to precedence of observation. The analysis of some of the symptoms of acute pericarditis is very carefully made, and here in particular considerable importance is attached to local thermometry as an excellent diagnostic means (p. 115). Under the head of treatment of chronic pericarditis, full discussion is given to the question of the advisability of puncture in the event of the effusion giving rise by reason of its quantity to alarming symptoms, which other methods of treatment are inadequate to relieve. Many precautions should be taken in the operative procedure, and every care must be observed so as to avoid an error of diagnosis. Even when the operation has been successfully performed the consequences have not usually been so satisfactory as would at first appear. The simple puncture of the heart cavities with a capillary needle will not occasion fatal or even distressing symptoms. A case reported by Roger does not prove that cardiac thrombosis is thus produced. With respect to this interesting topic, we regret not to find the name of Dr. Roberts, of Philadelphia, even mentioned.

The author has no personal experience to record.

The second section comprises the different forms of myocarditis, fatty degeneration and infiltration of the heart, spontaneous heart rupture, cardiac hypertrophy, dilatation, and atrophy. No disease is more infrequent than generalized myocarditis. Localized myocarditis is not rarely encountered as an extension of inflammatory disease of the endocardium or pericardium. When it does occur, it is rather an affection with which we become familiar in the pathological amphitheatre than in the hospital ward. It is usually dominated by some well-known blood dyscrasia, usually that of rheumatism. It terminates not by suppuration or resolution, but rather by degeneration or "stifling" of muscular fibre. In the treatment of chronic myocarditis, even where there is granulo-fatty degeneration of tissue, the author is not without hope in its efficacy. He applies small repeated fly-blisters in the precordial region, and says their application is constantly followed by an amelioration of morbid sensations, and also by a better functional condition of the heart itself, as shown by diminished palpitations. The same amelioration may be obtained by punctuated cauterization either with the actual or the thermo-cautery (p. 237). He regards nux vomica as the *special stimulant* of the cardiac muscle. By the use of small doses of the powder or tincture he has obtained good results where digitalis had been evidently powerless. *À propos* of hypertrophy of the left ventricle the author adopts clearly the views of Gull and Sutton in regard to the causative influence of a condition of generalized arterio-capillary fibrosis. The treatment advocated by the author is not one directed to the heart itself, but to the arterial lesion, which is the efficient factor of the cardiac enlargement. He prescribes from 8 to 25 grains of iodide of potassium each day during two weeks, and alternates its use with tannin (8 to 15 grains per day) to be taken during a like period. Caffeine at the dose of 4 to 5 grains a day is useful in increasing diuresis and augmenting the contractile force of the left ventricle. The double result obtained by caffeine appears to be less work for the heart to do and greater vigour for its accomplishment.

The three hundred pages which are contained in the third section make almost a respectable volume by itself. In it we have the different inflammatory conditions of the endocardium described at length, all that pertains to an advanced knowledge of the chronic valvular affections,

together with an admirable article assigned to various special medications of heart disease. The influence of pregnancy upon the heart is also completely studied, and the diseases of the right heart terminate this important portion of the work. Peter regards acute endocarditis with formation of vegetations as only a less advanced form of ulcerous endocarditis. Amongst the complications which are most striking, and which are specially studied, are visceral infarctus. In the treatment of this form of disease he eschews in every form the use of digitalis, but commends the hypodermic use of ether and quinine and caffeine by the mouth. The work of Maurice Raynaud, who died shortly after the session of the International Congress in London, in 1881, is often referred to with great favour in the course of this article. The secondary consequences of chronic valvular affections, particularly in producing hyperæmic conditions of the viscera, are held to be of great importance. Two very excellent wood-cuts accompany the description of mitral stenosis (pp. 482 and 483). The presystolic murmur is present only on condition that the *right auricle is already and sufficiently hypertrophied*, so that there are instances in which it is not heard. Mitral stenosis may produce, but very infrequently, a diastolic blowing murmur. When found it is heard somewhat to the left and below the left nipple.

Sphygmographic tracings, borrowed from Marey and Lorain to illustrate this cardiac lesion, demonstrate that extrinsic circumstances, such as respiratory anguish or violent exercise, occasion irregularity of the radial pulse.

Sudden death in aortic regurgitant disease is mainly due to *neurosis of the cardiac plexus by material lesion*, and not, as is so often stated, provoked by the reflux of the blood from the aorta into the ventricle and the consequent bulbar ischæmia and circulatory oppression. No mention is made of Balthazar Foster's diagnostic signs of differentiation according as one or other cusp at the aortic orifice is wholly insufficient. Arseniate of soda alternated with iodide of potash, and a dose of one-twelfth grain daily, is advised. Here, again, as in the local treatment of cardiac diseases generally, the author relies upon Vienna paste, or punctuated cauterization with the hot iron.

The general treatment of valvular lesions is an admirable chapter on therapeutics of cardiac diseases of chronic nature. Our author is not loth to withdraw blood from the economy either by venesection, or by wet cups or leeches. In this manner he lessens considerably those congestive conditions of the lungs, brain, or kidneys which are time and again of such bad augury. Would that our therapeutists on this side of the Atlantic might read and reflect upon the wise counsels given in regard to this so-called "lost art" of bleeding! A pill of calomel, digitalis, and squill, āā gr. j, is often useful, and an expectorant mixture, in which kermes mineral and acetate of ammonia are combined, is one the utility of which we have already tried. The nausea and vomiting at times occasioned by granules of extract of digitalis, or digitaline, are effectively combated by one or two drops of laudanum in a teaspoonful of water.

Quite beyond the sphere of drugs called "cardiac"—at the head of which is digitalis—there are *general means*, and over everything, "the *decongestioning medication:*" sometimes that which frees directly one or other engorged viscus (lungs, liver, or kidneys), and that by local bleeding or fly-blisters; sometimes that which acts upon the entire mass of blood and at once by *venesection*.

In regard to the comparative indications of digitalis and caffeine in organic diseases of the heart, the author writes: "Digitalis is especially indicated in cases of excessive frequency of cardiac beats, with tumult and irregularity; caffeine, particularly in cases of cardiac weakness, with slowness of the contractions." The fourth section embraces the neuroses of the heart, in which are comprised palpitations, angina, and exophthalmic goitre. The work concludes with the study of inflammatory affections of the aortic arch, and aneurism of this portion of the main arterial trunk.

Three fine chromo-lithographic plates representing myocarditis, chronic aortic disease, and embolism of the left median cerebral artery are appended to the printed text, and are a suitable crowning addition to this volume of thorough clinical work.

To sum up our general impression of the work, we would say it is really admirable throughout. It shows, in its philosophical grasp of a great subject, a broad intelligence. The symptoms and diagnostic differences are everywhere given with ample details. Many of the physiological explanations as applied to cardiac pathology are novel and striking. As to the therapeutic indications, whilst we cannot always agree, we invariably have read with interest the statements made by the writer. Many of his suggestions we accept with suspended judgment, simply because we have not tried them. It would be well if this work were translated for American readers, for, except Flint's treatise, which is fast becoming old, we have nothing to compare to it. B. R.

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ART. XIX.—*Practical Histology and Pathology.* By HENEAGE GIBBES, M.D., Lecturer on Physiology and Histology in the Medical School of Westminster Hospital; Late Curator of the Anatomical Museum, King's College. Second edition. 12mo. pp. 154. Philadelphia: P. Blakiston, Son and Co., 1882.

WITHIN the two years which have sufficed to call forth a second edition of this little book, it has certainly gained for itself an enviable esteem as a reliable and excellent synopsis of practical methods; the present revision will go far to strengthen its favourable reputation. The book has been somewhat enlarged by an increment consisting of two chapters to the pathological section regarding the now universally studied Bacteria, as well as by additions and alterations in the original matter.

The paragraphs devoted to microscopes and lenses, naturally, contain changes and additions to bring the text to date, as within the last two years much has been done in the now almost universally manufactured oil immersion lenses, to the admirable qualities of which Dr. Gibbes adds his tribute. The advice to the casual worker, however, to purchase an oil immersion without correcting adjustment on the ground of the practice incident to training the eye to know when the lens is properly adjusted, we hardly endorse. That these lenses should have correcting adjustment to render their performance equally good under varying conditions of preparation and immersion fluid, is now conceded by nearly all first-class makers. Oil immersions are so sensitive to the correcting collar that the eye soon learns to recognize the point of best definition, and it must, indeed, be a casual worker to whom the acquiring of this eye-

training is not worth all the time it costs. Practical men, as a class, are lamentably deficient in obtaining the best results with their instruments; surely those to whom lenses are a means of investigation should be able to handle and manipulate their tools to the very best possible advantage, and especially should they be able to tell whether their lenses were fairly corrected for present conditions. That a correction on an oil glass *is* of practical value where the highest definition is required is undoubted, as the seeing of delicate detail, as intra-cellular networks or striæ, is sometimes the matter of a turn of the collar; moreover, with a non-correcting lens the best effect is by no means always at once obtained, since frequently for their best performance correction by varying the length of the tube of the stand is necessitated; if, however, such care be deemed superfluous, then with equal facility can the collar of the adjustable lens be always placed at the same point, with the advantage that useful education of the eye may be had without a change of lens. It would have been well to state that the great nuisance of cedar oil and damaged mounts can be disposed of by the substitution of other immersion media, among the best of which is Van Heurck's (balsam copaiba and vaseline or oil of cedar)—which are now generally adopted by American makers, whose oil immersions are second to none; these immersion-fluids wash off readily with water, and do not affect ordinary mounts.

It is gratifying to note that the importance of proper illumination is still more emphasized, and neutralizing blue glass for artificial light and the achromatic condenser recommended. Even a limited observation will convince any one that of the many using the microscope with artificial light, it is but the exception to see proper illumination receiving attention; without blue glass the appearance of many stainings is entirely marred; without careful graduation and proper adjusting of the intensity of light the definition of the best lens is impaired.

We also find a passing word in favour of large stands, with all the refinements for delicate work. In this the author is quite in accord with the experience of many—for the work-table a small stand (the simpler the better) is indispensable; when, however, a careful examination or exact observation is on hand, in which every gain in definition is of importance, the large elaborate stands, when properly handled, show preparations in a manner never approached by the small laboratory stand, this being especially so regarding the continental or "Hartnack" model. To the many attached to the latter stands, this may seem exaggeration, but careful comparison will, we believe, confirm the assertion.

The chapter on Staining has been remodelled by many additions and some omissions, the list containing the more recent dyes, including many anilines. We regret that the author should have seen fit to drop from his list carmine. While true that for research hæmatoxylin has largely taken its place, yet carmine is also useful when carefully applied, giving admirable differentiation, which for ordinary sections is equal to that of hæmatoxylin, and withal possessing a certainty of permanence as well as greater transparency of colour, to which the latter cannot claim. If not favoured, it certainly deserved its former place in the list of stains, in which Bismarck brown could with propriety have been included, as for some purposes—as photography—it is especially valuable. The sections on double and triple staining possess their former interest. In the paragraph regarding choice of cover-glasses we mark a change in opinion; formerly with the scorn of the "practical men" round covers, with the

turntable, were consigned to "where æsthetic mounting is the order of the day." The advantages of square covers resulting in clumsy and insecurely cemented slides, when the greater ease, security, and rapidity offered by a turntable and round covers were at hand, we confess never to have appreciated; however, the necessities of oil immersions, and perhaps glycerine mounts, have modified our author's opinion, and we now find "for ordinary work square covers will do," but ones appropriate for use with the turntable are recommended when the slides are to be securely sealed. A chapter on injecting has been added to the space allotted to technology.

The section devoted to "Practical Histology" has been rendered more complete by the insertion of descriptions of a number of the varieties of the connective-tissue group, including endothelium, which were before wanting.

It is, however, the pathological section which has received the largest share of new matter, the pages from barely five being increased to forty. Useful hints are added as to sealing up jars with preparations for the museum, as well as the directions of Mr. Prestley Smith regarding the "Mode of preserving ophthalmic specimens," which will be of value to those interested. The final two chapters of the book are devoted to Bacteria; one to the methods of culture employed by Klein for the B. anthracis and of Koch for the B. tuberculosis, the other to the methods of staining these organisms. The principal staining methods for the B. tuberculosis are given, including those of Koch, Ehrlich, Weigert, Baumgarten, and our author. Of especial interest, in this connection, is the method of Dr. Gibbes to double stain sputum at once, possessing the advantages of rapidity and of dispensing with the use of nitric acid. Rosaniline hydrochloride, methyl blue, aniline oil, rectified spirit, and distilled water compose the formula. "It brings out the bacilli quite as well as the other processes, and it stains all putrefaction bacteria and micrococci very deeply, so that in one field of the microscope blue micrococci and bacteria may be compared with the red bacilli of tubercle"—a statement quite in contrast with the assertions of those who deny the specific staining of the B. tuberculosis.

On turning the last page of this little book, one feels that a really valuable guide lies before him; one exactly adapted to the needs of those to whom laboratory instruction has never been available. Our author shows in his methods a care and respect for exactness to be warmly recommended—a happy compromise between the fruitless nicety of the microscopical dilettante and the wilful negligence of the practical worker.

G. A. P.

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ART. XX.—*Index-Catalogue of the Library of the Surgeon-General's Office, United States Army. Authors and Subjects.* Vol. IV. E–Fizes. 4to. pp. [12] 1033. Government Printing Office, Washington, 1883.

THE appearance of each new volume of this most important work is a subject of congratulation, not only to those who have been concerned with its preparation, but to every really scientific physician.

When the predecessors of this volume were issued, we spoke of the magnitude and scope of the work. It is therefore unnecessary again to express our sentiments thereon. The present issue contains 4802 author-titles, representing 1926 volumes and 3885 pamphlets. 12361 subject-

titles of separate books and pamphlets, and 48,977 titles of articles in periodicals are also included within its covers.

Turning at random to one subject, with a view of forming some estimate of the thoroughness with which the work has been done, we find that "Excision" has no less than twenty-four pages devoted to it, while the titles of works upon the eye extend from page 450 to page 549.

There is but one matter to regret in connection with the publication of this invaluable work, and that is, the limited editions with which, owing to the unwise parsimony of Congress, the Surgeon-General's Office is obliged to content itself. It is to be hoped that this state of things will not be allowed to continue, but that the individual members of the profession will exercise such an influence upon their representatives in Congress, as will induce them to vote for a much more liberal appropriation at the present session. It is a subject into which no partisan feelings should enter, and to forward which there should be exerted a unaminous effort on the part of the medical profession, and of scientific men in general.

The projector of this vast work has given to it an amount of honest labour, scientific attainment, and practical skill which entitle him to the highest praise, and which should secure to him all the support for the furtherance of his plan which the medical profession can bestow or secure.

S. A.

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Art. XXI.—*Practical Clinical Lessons on Syphilis and the Genito-Urinary Diseases.* By Fessenden N. Otis, M.D., etc. 8vo., pp. 584. New York: Bermingham & Co., 1883.

The first thing to be remarked about this book is that it is in no sense what the title on its back—"Genito-Urinary Diseases and Syphilis"—would lead one to expect. It is not a treatise on the diseases of the genito-urinary system, but simply two volumes, elsewhere printed separately, one of them treating of syphilis and the chancroid, and the other of gonorrhœa and its sequelæ. This fact is rather forced on the reader's attention by the other fact that the middle of the book contains four pages of "contents," between pages 260 and 261, and that a duplicate of this, paged 15–18, stands at the beginning between pages 14 and 17! If anything else were needed to emphasize this point, it would be supplied by a circular, recently issued by the publisher, announcing two volumes for sale with the two titles we have given. This present union may be an advantage, or may not; it certainly will be none if it leads the buyer to suppose he is getting what the author in his preface distinctly disclaims his work to be; for he says, "No attempt has been made to make it a systematic general exposition of genito-urinary diseases."

If we take the book for what it is, we find in it much that is interesting and much that is instructive. One need not be an entire convert to all the author's opinions to get profit from them. His views of the nature of syphilis and syphilitic infection, for example, are interesting, and deserve careful consideration, though one may rise from their study with a conviction that they are more ingenious than conclusive. These views have been before the world for more than ten years, and they have not yet, as far as we are aware, been accepted by a single syphilographer of repute. The claim of the author that they have been "practically" adopted by

several authors, whom he names, seems to be founded upon his taking their words for a little more than they meant. Thus, the fourth edition of Bumstead and Taylor's book is cited as supporting them; but this support does not appear in the language Dr. Otis quotes, and it is specifically and somewhat indignantly disclaimed in their fifth edition, where, after denying him the merit of originality in the views he holds, the writer says: "Dr. Otis asks us to assume certain fancies in the absence of definite facts, and to felicitate ourselves with the idea that we know how syphilis works in the system, when the truth is that we do not." The theory of Dr. Otis is, that the syphilitic contagium is not a virus, in the ordinary acceptation of the term, but consists of degraded germinal cells, which, invading the healthy tissues, multiply and affect the healthy cells of the recipient with their own vicious nature or habit, so inducing the entire disease. This theory, as we have stated, has a great deal of ingenuity, but it is as yet entirely unproved.

In speaking of the chancroid, Dr. Otis plants himself firmly on the theory that it is simply a venereal ulcer. In this he shares the opinion of the majority of modern authors. It is a satisfaction to one who is convinced of the correctness of this theory to find him calling the chancroid the "venereal ulcer." In connection with the history of the chancroid, he speaks of its undeniable antiquity, as compared with the comparatively recent appearance of syphilis. In doing so he rather weakens the force of his previously expressed belief that the latter disease was known to Moses, and his acceptance of the rather questionable authority of Captain Dabry that it flourished in China over two thousand years before the Christian era. The sort of evidence upon which the opinions of the great antiquity of syphilis rest is so aptly illustrated by Tartenson (*La Syphilis*, Paris, 1880) that we cannot refrain from referring to it a little more fully here. Tartenson, like Dr. Otis, accepts the authority of Captain "Gardy" (whom Otis, as well as Bumstead and Taylor, calls "Dabry"), and specifies the lesions he found described in the ancient Chinese writings, which can hardly be doubted to have been syphilitic. He, however, says the most ancient of the writings which he translated were of the seventeenth century B. C.—three hundred years less than Otis says. Then he goes on to speak of its antiquity in India. For proof of this he relies on a work on medicine, which he says is called the *Sucrutas*, and was written in the fifth century B. C. But certain German scholars have maintained that this is not the name of a work, but of an author, called variously, and that the various names under which it appears are only corruptions of "Socrates," to whom many comparatively modern productions have been, in India, attributed. He also cites a myth about Vishnu, as follows:—

"Siva, seduced by the beauty of the wives of the worshippers, took the form of a young mendicant of perfect beauty and went to the gathering place of the penitents, accompanied by Vishnu, disguised as a girl. The latter cast such tender glances at all the men that they became enamoured of him, and left their sacrifices to follow him. During this time Siva went toward the house of the women, who, hearing him sing, were charmed and came running around him. Their agitation was so great that they dropped their jewels and their garments without perceiving it, and followed him in the costume of nature. They all accompanied him thus into a neighbouring grove, where he obtained from them what he desired. When the worshippers discovered their dishonour, and the stratagem of which they were the victims, they resolved to be avenged of Siva, and demanded of the gods the punishment of the guilty one. Thereupon a fire fell upon the genitals of Siva, and separated them from his body. Enraged at being visited so cruelly, Siva resolved to transmit this frightful malady to the

whole world. The victims were already numerous when Vishnu and Brahma, who are charged with the preservation of the creatures, arrested the evil. Siva, however, would not be moved by their prayers, except upon condition that mankind should render divine honours to his genitalia."

This is a myth; so is a great deal of the evidence upon which the antiquity of syphilis rests.

The third principal division of this book treats of gonorrhœa and its sequelæ. The author holds, with most modern authorities, that gonorrhœa is a non-specific disease. In support of this view he cites a number of interesting proofs, which are still needed, since there are those who yet believe there is a specific virus for this affection. He says that gonorrhœa is "without ulceration." It is true that ulceration is very rare, but it would appear from the endoscopic investigations of Grünfeld (see *Med. Jahrb.*, Bd. iv., 1877) that he at least believes in its occurrence; and there is certainly a condition, first studied by Désormeaux, and well described by Grünfeld, analogous to granular conjunctivitis, which comes pretty close to that of ulceration.

Of course this book contains a full statement of the author's well-known views in regard to the normal calibre of the urethra, and the proper treatment of stricture. These views have met with decided approval on this side of the Atlantic, but have not been so well accepted across the water. One who is so old-fashioned as to doubt what to others seems so plain may see in many an American surgeon's armamentarium those enormous bougies which look like truncated walking-sticks, and which give a sort of horror to one who has not used them. But it seems only fair to admit that they must be the best judges of their safety and utility who have tried them, unawed by any preconceived notions of the smallness of the urethral canal; and these are practically unanimous in their favour. Dr. Otis gives us not only his own report of successes by dilating and cutting strictures, but also a strong array of the experience of other surgeons who have adopted his method. The most important of these show the condition of patients after intervals of five or six years, and there are hundreds of apparent successes that have not been so long a time under observation.

Dr. Otis is a believer in the frequency with which preputial irritation is a cause of reflex nervous disturbances, citing, among others, a curious case from Dr. Brown-Séquard, where all the symptoms of *ramollissement* of the brain were removed by curing a phimosis accompanied with balanitis. Contraction of the meatus urinarius he likewise regards as a cause of various reflex disorders, and gives a number of cases to support this view.

In the last "Lesson" the author discusses exploration of the bladder by means of a perineal incision. He claims that this operation was appreciated in America at least ten years before it was proposed by Sir Henry Thompson (January 3, 1883) as a "new" method. We think, however, that Sir Henry Thompson will not consider the case to which Dr. Otis refers conclusive proof of the justice of this statement. Nor do we. The author, in speaking of the merits of the operation, gives a sensible warning against looking upon it as one to be lightly undertaken, and gives cases of his own to illustrate that it may be not only useless, but also dangerous.

With this we are at the end of our necessarily brief analysis. To do full justice to the book would require more space than we can spare. There are many interesting points in it which we have not been able to

touch at all. As a whole it is full of interest and instruction. Being the expression of the results of a long experience it could not well be otherwise. Unfortunately, it has not the advantages it would have were it what, as has already been said, the author did not intend it to be—namely, a systematic treatise. It will be useful to the practitioner who has time to read it, and especially to the writer who wishes to understand the views of one who has had an unusually large experience in the treatment of the diseases of the penis. But for the student and the busy general practitioner we fear its bulk will prove a disadvantage. C. W. D.

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ART. XXII.—*The Principles and Practice of Surgery, being a Treatise on Surgical Diseases and Injuries.* By D. HAYES AGNEW, M.D., LL.D., Prof. of Surgery in the Medical Department of the University of Pennsylvania. Profusely illustrated. Vol. III. 8vo. pp. 784. Philadelphia: J. B. Lippincott & Co., 1883.

"WITH the completion of this volume, the third, of a system of surgery, terminates a task," Professor Agnew tells us, "which has occupied, for more than five years, whatever moments of leisure have been at my command." Like its predecessors, it presents the well-established views of surgeons generally, the results of personal observation and experience, matured opinions upon vexed questions of theory and of practice, tabulated records of certain important operations, and more than five hundred illustrations of diseases, injuries, instruments, and appliances, the majority of them prepared especially for this work.

In it are considered the diseases and injuries of the *nose* and of the *air-passages;* of the *eye*, and of the *ear;* of the *mammary gland;* of the *muscles*, *tendons*, *bursæ*, and *fasciæ;* of the *nerves;* of the *lymphatics;* and of the *skin;* together with the more general subjects of *syphilis*, *tumours*, and *malformations;* and finally the surgical applications of *electricity* and *massage*. To properly and justly review a work covering such a field neither time nor space permits; all that can be done is to notice what, here and there, has happened more especially to attract attention.

Believing that, both anatomically and clinically, idiopathic and diphtheritic croup are two distinct diseases, Professor Agnew recommends the performance of tracheotomy in the former, but reserves the operation in the latter for only the "very exceptional cases."

"Where the signs of local lesions are associated with those of general blood-infection, as seen in the discharges of the nasal fossæ, and in a general exhaustion altogether disproportionate to the obstruction of the air-passages, operations are useless. Many of these patients die independently of laryngeal or tracheal obstruction, and can derive no benefit from the opening of the windpipe, whether the operation is intended to be curative or is done for the sake of euthanasia. . . . When I take into consideration the numerous recoveries under my own observation which have taken place, where operations have been declined, I cannot believe that intrinsically tracheotomy in croup has diminished the mortality of the disease to the extent claimed by a number of writers."

When the air-passages are opened, tracheotomy is preferred to the operation through the crico-thyroid space, *i. e.*, inferior laryngotomy.

"The operation which consists in puncturing the soft parts and the trachea, and laying both open at a single incision, is a dangerous practice. All such stabs in the dark are reprehensible." Mention is made of the use of the Paquelin thermo-cautery knife "in one case." Since that paragraph was written, such knife has been used many times and very advantageously. In the four cases in which I have myself employed it, I have been much pleased with its action.

Of complete extirpation of the larynx 36 cases are tabulated, of which 30 died.

"While, therefore, the extirpation of the larynx for carcinoma may be regarded as a striking proof of the manual skill of the surgeon, and a remarkable demonstration of the capacity of the human body to endure mutilation, I am far from admitting that it is a triumph of surgery or even a justifiable procedure."

Operative procedures for the relief of deviated nasal septum are regarded with but little favour. "Very much, however, can be done by wedging, if perseveringly maintained."

Under the name of *screatus* is described "a singular neurosis of the nasal passages" not previously described.

Characterized by paroxysms of short noisy inspirations or snortings, . . . continued with increasing rapidity and energy, sometimes for two or three minutes, until probably a small bolus of mucus is hawked up and spat out, or until the patient becomes utterly exhausted, and they cease from lack of muscular power to sustain them."

Congenital club-foot is declared to be "for the most part due to muscular spasm, while the non-congenital is usually the result of infantile paralysis." Tenotomy is strongly favoured, it being asked "why take months to correct a rebellious deformity of the foot, which, with the knife, can be overcome in as many days?" When, in an old case of equino-varus, "from distortion of the tarsal bones and the resistance of the ligaments, correction by tenotomy and instrumental measures is impossible," removal of a tarsal wedge is preferred to excision of the cuboid. The introduction of the former operation is credited to Mr. Colby (Davies Colby) of London. Weber, at Heidelberg, first made it in 1866, his patient dying of hospital gangrene.

In treating of genu-valgum attention is called to the necessity of studying carefully—

"The transverse breadth of pelvis between the acetabula and the length of the neck of the femora, both of which must materially affect condyloid pressure. . . . It is not difficult, therefore, to understand how a little increase either in the transverse diameter of the pelvis or in the length of the neck of the femur would increase the pressure resulting from standing, or even that from muscular contraction, upon the external condyle, and thus cause, while the bones were still in a plastic condition, some absorption of that condyle and the corresponding portion of the tibia; while the growth of the internal condyle, in the absence of the normal pressure, would be increased."

Gradual straightening by the application of the ordinary knock-knee apparatus is duly treated of; but no reference is made to the use of a plaster of Paris splint, which is certainly to be preferred to the wooden splint mentioned as a substitute for the, often times, too expensive apparatus. Of the various methods of osteotomy for the relief of in-knee, MacEwen's is preferred. No mention is made of Didot's operation upon webbed fingers, or of Busch's in the treatment of the "Dupuytren finger contraction."

The statement that after a muscle-wound "the bond of union will be fibrous, muscular tissue not being reproduced when once destroyed," while true as a general statement, is a little too absolute, as regeneration of muscle fibre under such circumstances has been known to take place.

Suturing of divided tendons in old cases of non-union is advised, the surgeon in such case being directed to "adhere in the strictest manner to antiseptic details of dressing."

In the treatment of ganglia the seton is declared to be "entitled to most confidence." A case is reported of bursæ of the extensor muscles of the thumb, which were excised. Larger has recently (*Rev. de Chirurg.*, 1882, p. 403) described a "new tendinous synovial sheath," a little higher up on the radial border of the forearm, which may be the seat of acute crepitating teno-synovitis. Two such cases have come under my own observation during the past year.

In the chapter on the "Surgical Affections of the Nerves," there is given an extensive and valuable table of cases of nerve stretching, "collected for me by Dr. Harte from various medical journals;" which in itself and in the analysis of its 350 cases will prove of much interest to every one interested in this subject. Of the 11 reported cures in 46 nerve stretchings, for tetanus, the author says, "As internal remedies were also administered in these cases the successes cannot be justly attributed to the operations; and yet, as the proportion of cures is greater than ordinarily occurs under internal medication alone, it is scarcely fair to conclude that the nerve-stretching had no favourable effect."

The temperature in tetanus, it is stated, "will, a short time preceding death and for some time after, rise to 110° or 112°;" *may*, rather than *will*, would have been more correct. "The well-known graphic delineation of a patient of Sir Charles Bell's," it is very justly declared, "portrayed an acrobatic rather than a pathognomonic posture."

It is a little startling, but at the same time comforting, to read in the statement of the symptoms of tetanus and hydrophobia that while the latter disease is always fatal, in the former recovery is "frequent." Chloral-hydrate is "the remedy which appears to possess the greatest efficacy;" and a belief is expressed that "many patients perish from too much medication and too little feeding."

In the sub-chapter on *erysipelas*, the membranes of the brain are stated to be *prone* to suffer from inflammatory attacks of this nature, the disease being propagated from the scalp through the vascular connections which exist between the latter and the meninges. Is not this danger of secondary intra-cranial inflammation very much a surgical "bug-bear?" Certainly statistics show that the mortality of simple erysipelas of the scalp and face is but slight. The prodromic affection of the cervical lymphatics in these cases, as the rule, has not been observed. Exception may be justly taken to the breadth of the statement that "the effect of an erysipelatous attack on recent wounds or on ulcerated surfaces is entirely inimical to repair." Not so very seldom it happens that an old ulcer is stimulated to rapid healing by such an occurrence.

The micro-organism cause of the disease is not altogether accepted, the part played by the bacteria being regarded as "still an unsettled question." It certainly is much less unsettled since Fehleisen's investigations and inoculations than it was when these paragraphs were written.

The chapter on *syphilis*, as far as the theoretical part of it is concerned, will be received with less favour than any other in the book. Regarding

the disease as of "prehistoric" beginning, Professor Agnew declares that he is "not disposed to recognize two distinct sources of origin, or, what is equivalent to this, two distinct venereal poisons, one giving rise to hard chancre, and the other to soft chancre;" both diseases being due to a purulent secretion, chancre to some contained "subtle material, possibly a particle of living matter," chancroid to the "purulent component of this secretion." "The possibility of converting a chancre into a chancroid, or *vice versa*, I have no reason to doubt."

An abortive plan of treatment is advised in the early stage of chancroidal bubo. Constitutional treatment, it is thought, should be commenced only on "the first appearance of generalized syphilis," and that treatment the mercurial. A necessary connection between syphilitic arteritis and aneurism is not believed in.

Of the "Hutchinson teeth" it is declared that "many syphilitic children are born and grow up without any of the above distinguishing dental peculiarities, and not only so, but these vices of conformation are sometimes closely imitated by constitutional conditions very different from syphilis, such as rheumatism, rickets, and mercury-poisoning."

Mineral waters, hot springs, etc. are not thought to exercise "any curative power over the disease." Marriage of syphilitics is not sanctioned; and prostitution is believed to be an evil "which comes legitimately within the province of civil law."

To the consideration of tumours much space (one hundred pages) is devoted. The subject is treated both generally and specially, and is illustrated by a large number of wood-cuts of microscopic and macroscopic appearances; the former taken from Dr. Formad's *Manual of Microscopic Diagnosis*, and drawn, the "most of them, from specimens furnished from my own operations."

Three conditions, it is held, are "necessary to the development of a morbid growth, namely, structural peculiarity, a specific irritant, and inflammation. . . . The absence of any one of these factors will be fatal to the active manifestations of the remaining two." In this connection it is interesting to notice the declaration that "muscular contusions often constitute an important factor in the genesis of morbid growths, especially sarcoma." Assuming an epithelial origin of carcinoma, and recognizing the marked predisposing agency of hereditary antecedents, the local origin of the disease is not accepted, though the exciting influence of local traumatisms, with their resulting inflammation, is strongly insisted upon. The liability of old ulcers to carcinomatous degeneration is duly referred to.

Six varieties of the disease are described: "the epithelial, scirrhous, encephaloid, telangiectatic, colloid, and melanotic;" in none of which is medical treatment of any kind of any benefit, except in so far as it may relieve pain and improve the general condition. The introduction of Chian turpentine is credited to "a London physician." Surely John Clay, of Birmingham, is entitled to recognition by name and proper residence; if his remedy has proved, like all the rest, of no value, it certainly was introduced, used, and reported upon in a very different way from *condurango*. Excision is preferred to every other method of surgical treatment, the use of caustics being limited to "cutaneous carcinoma," and then only "when patients are unwilling to submit to excision." In mammary cancer, however, operative interference is, it would seem, not very much favoured, except as, in properly selected cases, increasing comfort and pro-

longing life. The disease is thought to return with almost absolute certainty, though even then it is advised to remove secondary tumours "so long as there are no signs of internal deposits."

"I do not despair of carcinoma being cured somewhere in the future, but this blessed achievement will, I believe, never be wrought by the knife of the surgeon. We may hope, however, for the discovery of some drug which, operating through the general system, will follow and destroy the vagrant cells, and do for cancer what mercury and the iodide of potassium have done for syphilis."

The concluding chapters upon *electricity*, *nerve-stretching*, and *massage*, though brief, are interesting and of value.

The volume (indeed the whole work) is remarkably free from typographical errors, only a very few of them having been noticed. It is to be regretted that the majority of these are in the spelling of proper names, a notable fault in Continental books, but one which ought not to be permitted to occur in those published in this country.

In here bringing to a close this notice of the third volume of "Agnew's Surgery," it only remains to express the pleasure had in even hurriedly glancing over, still more in carefully reading, the chapters of the several volumes of this valuable contribution to American professional literature. Its author should never regret the use made of the leisure moments of more than five years. May the future fully compensate him for his studies and his labours! In a new edition a rearrangement of the chapters may advantageously be made. P. S. C.

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ART. XXIII.—*Centuria di parti prematuri artificiali provocati.* Dal Dottor CESARE BELLUZZI, dal 1860 al 1882. Bologna, 1883.

*One Hundred Premature Parturitions Artificially Induced.* By Dr. CESARE BELLUZZI, from 1860 to 1882. 4to. pp. 33. Extracted from Series IV. Vol. V. of the *Memoirs of the Academy of Sciences of the Institute of Bologna*, and read at the session of April 8, 1883. Bologna: Gamberini & Parmeggiani, 1883.

THE first memoir upon the same subject, presented by Dr. Belluzzi, was read before the Academy of Sciences, at its sessions of February 26 and March 7, 1874, and appeared in its Bulletins of October and December, 1874, and February, 1875; it contained the records of 59 cases. The second memoir, which is a continuation of the first, and more especially under review, presents the results of 53 cases; which, with the preceding, gives a record of 112 cases; of which forty-two were treated in private practice, and seventy in the Maternity of Bologna.

Artificially induced labour was excited nine times for disease of the mother; once, because in all previous gestations the fœtus had died in utero during the ninth month; and one hundred and two times in contracted pelves. Of these 102 cases, six died; three out of thirty-eight in private practice, and three out of sixty-four in the hospital. Of the nine women operated upon because of the existence of grave disease, seven recovered. Thirty-five out of forty-two infants were delivered alive in private practice, and the still larger proportion of sixty-two out of seventy in the Maternity. The subsequent mortality of the latter was, of course, much greater than

of the former, as very intelligent care in feeding, and sustaining the temperature of the body in premature infants, is requisite to their being kept alive until full infantile vigour is attained.

The author presents the following comparative table of the results attained in hospital practice, by artificially-induced parturition, in cases of pelvic contraction :—

| Hospitals. | Accoucheurs. | Cases. | Death of mother. | Fœtus stillborn. | Survival of children. |
|---|---|---|---|---|---|
| Maternity of Bologna, 1862–82 | Dr. Belluzzi | 64 | 3 | 7 | 29 lived through the month. |
| Obstetric Clinic of do. 1873–82 | " Massarenti | 33 | 2 | 4 | 21 living at end of 5 to 12 days. |
| " " Padua " | " Frari | 9 | 0 | 2 | 3 " " some " |
| " " Palermo " | " Pantaleo | 11 | 1 | 4 | 4 " " " " |
| " " Rome " | " Pasquali | 27 | 3 | 14 | 8 " " a month. |
| Maternity of Brussels | " Hyernaux | 28 | 2 | 10 | 9 " " 10 days. |
| Obstetric Clinic of Liége, 1857–18 | " Wasseige | 41 | 1 | 5 | 6 " " 10 " |
| Maternity Hosp. of Paris, 1873–82 | " Tarnier | 37 | 1 | 12 | 4 " " 9 to 15 days. |
| | | 250 | 13 | 58 | |

Collectively, as shown by this table, the proportion of deaths in the mothers is a fraction over 5 per cent., and of the children a little over 20 per cent.

To the above record of cases we may add that of Dr. Ludwig Winckel, of Mülheim, Germany, who delivered twenty-five women, all affected with contracted pelves, from the year 1846 to 1876. These patients all recovered; their ages ranged from twenty-one to forty-five years. Two were delivered in the thirty-first week of pregnancy; ten in the thirty-second; twelve in the thirty-third, and one in the thirty-fourth. Fourteen children were still-born, and thirteen were living. Of the thirteen, only seven were alive at the end of two weeks. The shortest conjugata vera was $2\frac{1}{2}$ inches; woman delivered in thirty-second week; fœtus dead. The patient delivered at the close of the thirty-first week had a conjugate of $2\frac{9}{16}$ inches; the fœtus was dead; the two mothers were both rachitic.

As the ultimate saving of the fœtus is one of the objects of the production of premature labour, Dr. Belluzzi has been careful to present the record of his cases at various periods after delivery; by which we learn that prolonged vitality in the fœtus is largely dependent upon the period in gestation which is chosen for the operation, or which the condition of pelvic stenosis will admit of being selected as the latest, with safety; the fœtus of eight months being much more readily saved than seven and a half, and the latter than that of seven months. He recommends that in hospital practice the cases should be kept in the institution for a much longer period than usual; that the premature infant should be fed by drawing the milk for it rather than by suction on its part; and that an artificial heating apparatus adapted for the purpose should be used to impart warmth to it. He estimates the measure of the true conjugate diameter of the pelvis, below which there is little hope of the survival of the fœtus, at 3 inches (7.5 cm.); admits that it is possible to save the fœtus in rare cases down to $2\frac{3}{4}$ inches (70 mm.); but denies the possibility of so doing below this limit. He appends to his monograph a collection of ten phototypes of the children saved by him, in the Maternity,

taken at various ages, ranging from a well-developed woman of twenty to a little girl of less than two years of age; the others being respectively fifteen, fourteen, thirteen, ten and a half, ten, eight, seven, and five years old, six being girls, and four boys. These pictures were nearly all taken in the fall of 1882, and constitute a very interesting collection, and one highly creditable to the skill and care of the accoucheur.

Dr. Belluzzi, with regard to the extremes of pelvic stenosis in his cases, says, that in his private practice the conjugate measurement ranged from $2\frac{7}{8}$ inches to $3\frac{3}{8}$ inches, with the exception of one case in which it was only $2\frac{11}{16}$ inches; and in the Maternity from $2\frac{3}{4}$ inches to $3\frac{1}{4}$ inches, with the exception of two cases in which it was $2\frac{1}{4}$ inches and $2\frac{11}{16}$ inches respectively.

The hospital mortality will be shown by the following in the record of 32 infants born alive out of 36 in the period from March, 1873, to November, 1882, viz.: Died in quarter hour, 1; five hours, 1; eight hours, 1; twenty-two hours, 1; one day, 2; four days, 1; five days, 2; seven days, 1; ten days, 1; fourteen days, 1; twenty-eight days, 1; one month and one day, 1; one month and two days, 1; one month and four days, 2; two months and six days, 1; three months and six days, 1; five months, 1; five months and three days, 1; five and a half months, 1; five months and nineteen days, 1; six months, 1; eight months, 1; eleven and a half months, 1; one year, 1; seventeen months, 1; and two years, 1. Three were living when the report was completed; two aged seven and a half years each, and one twenty months, out of the thirty-two.

The private practice of the author, and in which record we are more interested, shows a less discouraging mortality, viz.: From May, 1874, to September, 1882, he delivered 17 women prematurely, and saved 14 children. Of these 1 lived fifteen minutes; 1 some days; 1 two or three days; 1 two days; 1 four days; and 1 twelve days. Eight were still living at the time of writing the report, aged respectively about six months, ten months, one year (2), two years (2), and three years (2). In the previous memoir there were 25 cases, with 21 children born alive. This record embraced the period from 1860 to 1873.

Nine of the children were dead when the table was completed in 1873, and twelve were living, but at what ages we cannot tell, not having at hand the full report then given. We have then twenty children out of thirty-five that lived to a period to render their expectancy of life equal to that of infants, and children of their respective ages that have had the advantages of a full period of intra-uterine development.

Although the proportion of women in our own country requiring to be delivered prematurely is comparatively small, still there are many more than those thus treated by their accoucheurs. As the mortality in Bologna has been very small in the mothers, there is much to encourage our accoucheurs in imitating the example of Dr. Belluzzi, and thus to avoid the greater risks of delivery at full term. With the advantages of raising premature infants in private families, where they are frequently saved by the care and attention given, we ought to be able to rear a fair proportion of those saved from the perforator by an artifically induced labour. We have seen such small children raised in this city that we need not despair of doing the same with those hurried into the world of necessity by artificial means. The reviewer well remembers a large, tall woman, who died at the age of eighty-seven years, telling him, a long time since,

that she was a seven months' baby, and so small and delicate at birth that she was kept wrapped in wool for three weeks, and not dressed until that age. As she was born about the year 1771, and saved under the disadvantages of that period, we ought certainly to be able to do as well now with the fœtus of seven and a half to eight months. R. P. H.

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ART. XXIV.—*A Manual of Pathology.* By JOSEPH COATS, M.D., Pathologist to the Western Infirmary and the Sick Children's Hospital, Glasgow; Lecturer on Pathology in the Western Infirmary; Examiner in Pathology in the University of Glasgow; Formerly Pathologist to the Royal Infirmary, and President of the Pathological and Clinical Society of Glasgow. With three hundred and thirty-nine illustrations. 8vo. pp. 818. Philadelphia: Henry C. Lea's Son & Co., 1883.

WE are very glad indeed to welcome a manual of pathology from the pen of this author, who has become so favourably known to the medical world by his work in the direction of pathological anatomy and in other ways. He has been led to its publication, as he states in his preface, by the want of a complete English text-book, so much felt by himself as well as by others engaged in teaching pathological anatomy. The author has sought to give his text a somewhat more extensive scope than has been commonly attempted in the usual text-books, by including such parts of general pathology as help most particularly in forming a general conception of each morbid condition.

Part I. is devoted to a short introductory, followed by the discussion of *General Diseases* (pp. 285). Of these first come affections of the circulation and of the blood, such as hyperæmia, thrombosis, embolism, and certain of the hemorrhages, which are treated of briefly but very satisfactorily; there are also short articles on leukæmia, uræmia, and diabetes mellitus, which are not often so clearly described in a short space, and often are entirely omitted. Then follow inflammation, the retrograde metamorphoses, hypertrophy, repair, and the regenerations, the infective tumours, such as syphilis, tubercle, etc., and the morbid growths. His chapter on the parasites, vegetable and animal, contains a good deal of matter not readily come at except in a large library.

Part II. takes up the *Special Organs and Systems.* Some parts we should like better if they were fuller of matter; for example, more on the subject of changes in the form of the heart; a separate heading for dilatation finds place neither in the table of contents nor in the index. The section on the *Nervous System* is unusually full, and very well and very fully illustrated; in many respects it will be found more useful than some works we know of entirely devoted to this subject. The *Respiratory Section* is brief, but very clear and practical; its brevity has certainly shorn it of many parts which would have been especially confusing to the readers for whom the book is intended. The other sections seem to present the various morbid changes with sufficient fulness to render these portions of the work of marked value.

We would call especial attention to the illustrations. To any one purchasing the volume, we have to say that they will fully receive the worth

of their money in this item alone. In many recent works of both normal histology and morbid anatomy, it is somewhat difficult from the illustrations alone to tell whose books one is looking at. Coats's pictures are mostly original, and are very good; some, of course, are copied, but the selection has been well made, and from sources as yet not too much borrowed from already. The book will be found a very decided and valuable addition to the library of pathology. M. L.

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ART. XXV.—*A Practical Treatise on Materia Medica and Therapeutics.* By ROBERTS BARTHOLOW, M.A., M.D., LL.D., Professor of Materia Medica and General Therapeutics in the Jefferson Medical College of Philadelphia, etc. Fifth edition, revised and enlarged. 8vo., pp. xxii., 738. New York: D. Appleton & Co., 1884.

A BOOK which has reached its fifth edition so rapidly as this has done, and upon which the profession has passed so favourable a judgment, hardly stands in need of a review, or of having its merits pointed out. It is not out of place, however, to note that it has been kept fully abreast of the many and important changes constantly making in the knowledge of drugs and their application to disease, to say nothing of hydro-, electro-, and metallo-therapeutics, all of which are thoroughly treated in this edition.

In so popular a work as this it is perhaps more useful, if not so agreeable, to point out some of the faults which diminish its usefulness. Barring a few careless expressions, undoubtedly due to haste, they are not many, but of such a character as to justify a warning to the too confiding practitioner, lest he be doomed to early and frequent disappointment.

The author has evidently lost but little of his enthusiasm, and this mental status undoubtedly contributes largely to the success of the book. While Dr. Bartholow is far from being unaware of the fallacy of *post hoc*, etc., it seems to us that he has not infrequently either fallen into it himself, or accepted too readily the statements of others founded thereon. An instance of the reversal of "conclusions," even between two editions, is to be found on page 234, where he says "recent experience has *conclusively* shown the curative power of iodine in malarial fevers." . . . "Some recent experiences by Dr. Atkinson, of Baltimore, throw doubts on the previous statements. He found that iodine failed in two-thirds of the cases of intermittent fever."

He accepts too easily the statement of Dr. Barker (page 252) (which, however, he characterizes as "doubtful"), to the effect that "if (turpeth mineral be) given early, a fatal result (in croup) will most certainly be averted." Notwithstanding Dr. Barker's confidence, and the wide-spread publicity of his views, practice, and, unfortunately, its results, have remained essentially the same.

It is of course impossible at the present time to point out all the statements of this kind which the author will be called upon to modify in the many editions which are undoubtedly to follow; but if the experience of the past be any guide, they are not a few. Like many progressive therapeutists, he is not unduly respectful toward the traditions of the ancients, but he does not seem sufficiently mindful that the evidence upon which

many modern theories are founded is but little stronger, and of much the same character, as that which is rejected when urged in behalf of the older ones. The difference between new and old is not the same as that between true and false, even when the former is expressed in a little more exact physiological terms. It is no more than fair, however, to modify even this criticism, by saying that the author is quite as rigorous toward his own personal results as toward those of others, and perhaps it would be just to attribute his somewhat facile reception of over-confident assertions to politeness, rather than to want of due criticism. We cannot help wishing, however, that Dr. Bartholow had tempered his work with a little more discriminating skepticism; but, as it is, the physician must do this for himself, and will then find this book one of the most useful, and a credit to American literature. If he follows its guidance, he will have the consolation of feeling, even amid the failures which are the lot of all, that he has done for his patients all that medicine could do.

Let it not be inferred, from this page being devoted to criticism rather than to praise, that the great value of the work fails of appreciation. Its faults, rather than its merits, are pointed out because the latter are so thoroughly well known both at home and abroad, and its claims to admiration, in which the writer cordially shares, are so universally recognized.

R. T. E.

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ART. XXVI.—*Elements of Histology.* By E. KLEIN, M.D., F.R.S., Joint-Lecturer on General Anatomy and Physiology in the Medical School of St. Bartholomew's Hospital, London. Illustrated with 181 engravings. Pocket-size 12mo., pp. 352. Philadelphia: Henry C. Lea's Son & Co., 1883.

THE name of the author of this little book is so identified with this department of medical science, that any contribution from his pen must always command attention. With his own views so recently definitely stated in the admirable "Atlas of Histology," it is to be expected that a volume designed as a manual for students would, to a considerable extent at least, be a repetition of already expressed opinion. Such, in fact, is the present book, being largely an abridgment of the more elaborate text of the atlas, adapted to the present purpose, the descriptions being condensed or expanded as the exigencies of the subjects seemed to demand. Any extended review of the text, with that of the atlas so well known, seems superfluous; suffice it to say that the views regarding special points, as the intracellular networks, are fully carried throughout the manual. Of necessity, that attractive feature of the atlas—the illustrations—is largely lost, these being reproductions as cuts of many of the lithographic drawings of the atlas, as well as of those found in the "Handbook for the Physiological Laboratory," with a few additional ones from various special sources.

It is greatly to be regretted that, in a book especially designed for students, the statement of the amplification of the figures has been entirely ignored. By those having no knowledge from direct observation, how are definite ideas as to the relative size of various elements to be acquired where no magnifying power is indicated with illustrations, and where single cells sometimes appear larger than whole groups in other figures?

"Highly magnified" and "low power"—so common in books—are very indefinite and unsatisfactory substitutes for amplification expressed in figures, even if these be but approximately correct. To give the latter would have been no difficult task, since the enlargement of all original figures is accurately stated in the atlas, from which data the figures appropriate for the reduced cuts could readily be determined; this neglect is of frequent occurrence, but nevertheless to be condemned, as exact ideas and comparison of drawings are rendered much more difficult.

As the atlas at once commanded a place among the valued volumes of the special worker, so will the "Elements" be welcomed by the large number whose needs hardly warrant the purchase of the more expensive work, yet who desire concise and accurate knowledge as to the present development of histology. This need is more than filled by the present volume. While "elements" is an appropriate term when considering the great mass of described histological minutiæ, yet it is almost a matter of surprise how full and minute are the descriptions here found, the minute anatomy of many tissues and organs being presented with greater thoroughness than in works of far more pretension. This has only been accomplished by the adoption of the most concise descriptions; sometimes, perhaps, to the sacrifice of the explanations which would be desirable, in consideration of the presupposed ignorance of the young student; where every sentence is loaded with important statement, the tyro often fails to gain conceptions as definite and lucid, as where texts admit of descriptions more extended.

The fact of the book being a member of the "Student's Series of Manuals" must be the apology for its appearing as an under-sized 12mo., a form quite out of keeping with the volumes by whose side this excellent book should find its place; it is to be hoped, however, that at some future day the publishers may see fit to furnish it also in the more desirable form. G. A. P.

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ART. XXVII.—*A Treatise on the Diseases of the Eye.* By J. SOELBERG WELLS, F.R.C.S., Doctor of Medicine of the University of Edinburgh; Professor of Ophthalmology in King's College, London; Ophthalmic Surgeon to King's College Hospital; and Surgeon to the Royal London Ophthalmic Hospital, Moorfields. Fourth American, from the third English edition, with copious additions by CHARLES STEDMAN BULL, A.M., M.D., Lecturer on Ophthalmology in the Bellevue Hospital Medical College; Surgeon to the New York Eye and Ear Infirmary; Ophthalmic Surgeon to the Nursery and Child's Hospital, and to St. Mary's Free Hospital for Children. Illustrated with 257 engravings on wood and six coloured plates, together with selections from the test-types of Prof. Ed. Jaeger and Prof. H. Snellen. 8vo., pp. 846. Philadelphia: H. C. Lea's Son & Co., 1883.

LESS than three years have passed since we were called upon to notice the third American edition of this work, and the early demand for a fourth proves that we did not place too high an estimate upon its value. Quite a number of additions have been made since the last revision, to some of which it may be of interest to call attention. Among them is a descrip-

tion of an operation for entropium, which, with various modifications and under different names, has been a good deal discussed in the last few years. The editor speaks of it as a modification of Von Ammon's operation proposed by Von Burow.

"The lid is everted and the point of the knife is pushed through the tarsus near its outer end, a line or more from the cilia, and carried along between tarsus and muscle from the outer to the inner end. If the tarsus is very much thickened a wedge-shaped piece should be cut from the upper side of the incision. A narrow strip of skin is then excised from the length of the lid, and then from three to five sutures are inserted in the skin and the external wound closed. The incision through the tarsus may be made with a pair of scissors. This operation has been done by Green, of St. Louis, with good results."

Dr. Green, however, claims that he has made several important practical modifications in the operation as done by Von Burow; that Von B. makes the incision through all the tissues of the lid, instead of sparing the muscle, and excises a broad fold of integument, depending upon the traction of the skin resulting from bringing its edges together with superficial sutures, to keep the margin of the lid everted. In Dr. Green's operation—

"The needle is first introduced a little to the conjunctival side of the row of eyelashes, and is brought out just within the wound made by the excision of the strip of skin; it is then drawn through, inserted again in the wound near its upper margin, and passed deeply backward and upward so as to graze the front of the tarsus and emerge through the skin of the eyelid a centimeter or more above its point of entrance. On tying the two ends of the thread together the skin wound is closed, and the loosened lid margin is at the same time everted and brought into a correct position."

We have operated several times in accordance with his directions, with very satisfactory results. In the treatment of cicatrices of the face involving the lids, the editor has had a very favourable experience with the use of massage, as recommended by Dr. D. H. Agnew for hastening the process of interstitial absorption: when a depressed scar is adherent to the bone, he first performs Mr. Wm. Adams's operation of subcutaneous division of the adhesions.

The subject of diphtheritic conjunctivitis is more freely discussed than in the last edition. The editor admits that the pathogenesis of the disease is still in an unsettled state, and agrees with the modified statement of Von Grafe that "while in many cases diphtheritic conjunctivitis is a symptom of a general disease, yet there are cases in which it is a local disorder caused by infection with the secretion from a purulent conjunctivitis." In the chapter on granular conjunctivitis, an account is given of the recent investigations of Sattler upon the nature of trachoma. Sattler denies that lymph follicles exist in the normal conjunctiva, and regards the trachoma granules as a characteristic and specific product of the trachomatous process, the cause of which he thinks he has found in a special form of micrococci. He claims to have succeeded in cultivating the micrococci and producing positive results by inoculation with the third generation. Since this work went to press, Sattler has made careful and elaborate investigations into the nature of the ophthalmia produced by jequirity, concerning which, as a means of treatment in cases of obstinate trachoma, there has been lately so much discussion. It has been supposed by M. Wecker that the cause of the jequirity ophthalmia was some vegetable ferment, but Sattler could not succeed in extracting any chemical

product whose action was at all like that of the fresh infusion. He concludes that there is a bacillus which acquires in the jequirity infusion the property of producing this distinct form of ophthalmia when brought in contact with the conjunctiva. His theory of the cure of trachoma by jequirity ophthalmia, is that the micro-organisms of trachoma and those of jequirity cannot live at the same time upon the conjunctiva; that there is an irrepressible conflict between these opposing forces, in which the trachoma micrococci are driven from the field.

A considerable addition has been made to the chapter on Glaucoma, in which a *résumé* is given of the recent investigations made by Knies, Weber, Schnabel, Mauthner, Priestley Smith, and Brailey. It cannot be claimed, however, that these investigations have established the pathology of the disease or the theory of its cure on anything like a positive or generally accepted basis, and the subject is still, to a great extent, an open one.

The editor has, perhaps, given less attention to the chapter on Refraction and Accommodation than to most other parts of the work. The directions for the detection and correction of astigmatism might be made more definite and fuller, and more helpful to the beginner; and the entire ignoring of the metric system in the numeration of lenses is a very serious defect.

The quality of the paper and type is excellent, and the mechanical work upon the volume has been carefully and thoroughly done; altogether, the present edition maintains the standard of its predecessors, and keeps this old favourite still in the front rank of ophthalmic text-books. G. C. H.

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ART. XXVIII.—*The Pathology and Treatment of Venereal Diseases.* By FREEMAN J. BUMSTEAD, M.D., LL.D., Late Professor of Venereal Diseases at the College of Physicians and Surgeons, New York, etc. etc., and ROBERT W. TAYLOR, A.M., M.D., Professor of Venereal and Skin Diseases in the University of Vermont, etc., etc. Fifth Edition. Revised and rewritten, with many additions, by Dr. Taylor. With one hundred and thirty-nine wood-cuts and thirteen chromo-lithographic figures. 8vo., pp. 906. Philadelphia: Henry C. Lea's Son & Co., 1883.

THE recently issued fifth edition of this standard American treatise on venereal diseases deserves special consideration, chiefly because of the change announced in its authorship. Fortunately for the success of its future, this change has been gradually effected, and has, moreover, been one well calculated to enforce the authority and enlarge the prestige of the book itself. The fourth edition was, as is well known, the first in which the labours of the late lamented Dr. Freeman J. Bumstead were aided by those of Dr. Taylor. Scarcely, however, had that edition been placed in the hands of its reviewers, when the senior author ended with his life the regretful companionship of his colleagues. This is, therefore, the first edition for whose utterances Dr. Taylor is solely responsible.

A careful comparison of the volume with its several predecessors justifies the conclusion that the revision of the text has been judiciously and conscientiously made. Thirteen chromo-lithographic figures have been added, which will prove of some service to students, and also to medical men who are unfamiliar with the chief lesions represented. Dr. Taylor has also in this edition set forth the claims of the fluid extract of eryth-

roxylon coca as an adjuvant of other remedies employed in the treatment of syphilis. Without doubt a trial will be made of this medicament to an extent which will fairly test its value as a remedial agent. A brief chapter on syphilis and marriage has been wisely added, the necessity for which was clearly imposed by the appearance of Fournier's superb monograph on the same subject. The body of the work has been thus enlarged by about seventy pages.

The relation of micro-organisms in general to the diseases whose importance had entitled them in these pages to chief consideration is briefly discussed by Dr. Taylor. He judiciously avoids any explicit commitment of himself to the etiological importance of these germs, the facts certainly not warranting at this time any positive assertions. We should be tempted to believe that, if this etiological question were to be settled by therapeutical experiment, it would soon be transferred from the clinical amphitheatre to the closet of speculation; to believe, in fact, that if the germ theory of these diseases were to stand or fall by the success or the reverse of a treatment specifically directed to the destruction of the micrococci of gonorrhœa and syphilis, the results thus far obtained would weigh rather heavily on the unfavourable side of the scale. But the well recognized difficulty of promptly relieving diseases whose etiological factors are capable of much more exact demonstration, should lead us to be cautious in hastily inclining to either the one side or the other of this newly joined issue.

As it comes to us to-day, it is impossible to refuse the tribute which this volume both invites from its students and commands from its critics. It is a splendid record of honest labour, wide research, just comparison, careful scrutiny, and original experience, which will always be held as a high credit to American medical literature. No single man, indeed neither one of its authors, could sit down to-day and *ab origine* compose either it or a similar work of equal value. It represents to us that which is valuable, skilfully and laboriously rescued from an alluvium of twenty years' deposit. The physicians of this country have come to regard it as an old friend, and even to entertain a certain degree of affection for its familiar pages.

It is precisely for this reason that our author should seriously determine, in the subsequent editions which will certainly be demanded, to reduce the size of the volume, which should none the less include every new suggestion possessing any practical importance. Much of its material might be more concisely written; some of its pages add but little to its value; and a few facetious comments which meet the eye neither illustrate the worth nor add to the dignity of a standard text-book.

The subject, for example, of visual exploration of the deep urethra, is one of no little interest. "Instruments of precision," as they are often called, have an especial attractiveness for men of science. If the promise of the wood-cut were fulfilled in the performance, all would be well. It is not pleasant to admit that our natural powers are limited, and that their instrumental aids are more curious than useful. Such, however, must often be the verdict as regards endoscopy. If everything which it has taught or shown during the years which have elapsed since its introduction were suddenly lost from the sum of human knowledge, few physicians or patients would be for this the worse. The Désormeaux apparatus, still figured here on the 106th page, is expensive, clumsy, and practically a useless instrument, which still encumbers the armamentarium of the sur-

geon, possibly because every one thinks that it ought to be able to do what it is intended to, but really cannot, do. It is far inferior to the more recently devised but much more complicated contrivance of Leiter, by which the mucous lining of the bladder and urethra is illuminated by incandescent platinum. We have, however, with this latter carefully inspected the entire vesico-urethral tract when in a state of active inflammation, with net results practically limited to an appreciation merely of colour changes. He who has carefully studied the lesions perceptible in a naked eye observation of the mucous membrane in gonorrhœal conjunctivitis, has a far more perfect picture of the same changes in the similarly involved urethra, than can be gained by the endoscopy of this day. By as much as, for the wise physician, the tongue is an index to the condition of the deeper membrane which lines the distant stomach, by so much is the aspect of the mucous membrane visible on separation of the lips of the meatus urinarius an index to the condition of the deeper and distant portions of the same tract.

There are other points which will doubtless suggest themselves to the author when he imposes this future task upon himself. He will decline, for example, to recommend the mensuration of urethral sounds by passing them through circular apertures cut in either cardboard or steel, a procedure by which only those dimensions can be ascertained which are represented by the number of apertures. Even the manufacturers of wire have improved upon this. Nor will he attempt to establish the diagnostic characters of chancre and chancroid, by artificially squeezing into parallel columns items relating to the depth, size, edge, and secretion of the ulcer of primary syphilis, when it may be truthfully said that the majority of all such lesions are strictly initial scleroses, of which ulceration is always an accidental and rarely an important feature of the main process in each case. The text, however, on this point is far wiser than the table, since it sets forth very clearly the predominant features of the chancres of every grade and locality which are there described.

There is yet another among the changes which the syphilographic future will require, to which it is here proper to refer. It is a change desirable, not only on the ground of consistency, but also of utility. It concerns the vexed but important question of nomenclature. Mr. Hutchinson, of London, has been sharply criticized for his compounding of several terms in order to name a single disease, as, for example, in his "lupus-psoriasis" and "cheiro-pompholyx." But such terms as "impetigo-form syphilide" and "ecthyma-form syphilide" are none the less open to objection. It may be regarded as unphilosophical, and it is certainly confusing, to name and describe one disease in terms of another. It goes without saying that such a course implies and requires a knowledge of the one malady before the name—to say nothing of the nature—of the other can be grasped by the mind. The earlier astronomers refused to name one constellation of stars by any supposed resemblance to another, and turned for their titles to the beasts, the birds, and the fishes of the more tangible sphere on which they lived. Our anatomists, to come nearer home, have never named liver and bone because of a resemblance to kidney or muscle, but gained their end by the aid of substantives suggesting a key, a hammer, a ship, a sword, etc. The earlier dermatologists, too, selected a honey-comb, a fig, a live coal, a bubble, etc., as the objects by the aid of which they might compare and designate certain of the disease-symbols of the skin.

Nor is this all. When we speak of an "acne-form syphilide," the question most naturally suggested is: Which one of the eight or ten described forms of acne does the syphiloderm most resemble? We do not, however, ask this question because, as a result of previous observation and training, we know precisely what is intended; but for him who has not learned as much, the question will always be implied or expressed. Again, in that curious series of metamorphoses portraying to the eye the evolution of the variolous lesion, extending from the earliest maculo-papule to its final crust, at what point shall we find the type of the "variola-form" syphiloderm? Here again we know how to reply, but we only know it because we have studied the two diseases in greater or less detail, and are thus able to see the physical basis for either a comparison or an analogy.

We have brought forward this issue in this connection as one which should be recognized in the future editions of this standard treatise. It involves, however, no reproach for the writers of this book. They had and have the highest authority for the usage to which they conform, among the syphilographers both in their own and other tongues. They have but done their duty in reproducing in these pages the terms whose long currency has identified them with certain definite cutaneous symptoms of syphilis. Nowhere so well as here, however, can a change of this character be wrought, a change so conspicuous and effectual, that it will be largely followed in an effort to drop misleading and confusing titles. Americans have done great service in banishing from medical literature the incongruity of "syphilitic eczema," "syphilitic psoriasis," and their brood; and can without question do as much again in the same spirit.

We do not hesitate to express the belief that this is not only the best work in the English language upon the subjects of which it treats, but also one which has no equal in other tongues for its clear, comprehensive, and practical handling of its themes. With respect to the appearance of the book, including its typography and illustrations, we have merely to conclude by saying that the well-known publishers have done their part with their accustomed skill and taste. J. N. H.

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ART. XXIX.—*The Causation of Sleep.* By JAMES CAPPIE, M.D. Second edition. Rewritten. 8vo. pp. 207. Edinburgh: James Thin, 1882.

SLEEP is one of the familiar mysteries that science has yet to solve. Physiologists are of accord that it is accompanied by a diminished blood-supply to the brain—a relative cerebral anæmia. There is enough direct evidence in unassailable facts to support this view. But the mechanism by which such physiological ebb tides are brought about has not yet been made clear in such a way as to fully meet the requirements of all the phenomena of even healthful sleep. Nor has a theory yet been devised to explain the relation which the consciousness of sleep holds to that of various pathological conditions, such as hebitude, somnolence, coma-vigil, stupor, coma. Yet these conditions show resemblances and contrasts to sleep that must be understood if we are fully to know what sleep is, or

else which can only be explained when the mechanism of sleep itself is known.

The author's theory of the causation of sleep is set forth with greater fulness and exactness than heretofore, and he is at some pains to weaken the position of those who have, at various times, opposed his views. He urges strong objections against the theory that during sleep the whole mass of blood within the skull is diminished, and that this loss in the volume of the intra-cranial contents, is made up by a corresponding augmentation of cerebro-spinal fluid. His own view, in brief, is that the mass of blood remains constant, or practically so, and that during sleep there is an alteration in the balance of the circulation between the brain-substance and the venous system of the pia mater. A diminution of the functional activity of the brain, which means diminished molecular movement, is coupled with flagging capillary circulation and a reduction, *pro tanto*, in the volume of the brain; this is compensated by a turgescence of the venous system of the pia sufficient to exert a direct pressure upon the whole surface of the organ. With this pressure comes the unconsciousness of sleep. In the production of this venous turgescence the atmospheric pressure upon the veins of the neck is "an essential agent."

The argument to sustain this theory is ably and clearly stated, but it remains an argument. It does not amount to a demonstration. Valuable collateral evidence is brought forward, and treated with no little skill, but the direct evidence of experimental research, by which alone a theory of this kind can be supported, is wanting.

The book is illustrated by two excellent coloured drawings, showing in contrast the appearance of the retina of a girl in her ordinary health and in profound epileptic coma. J. C. W.

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ART. XXX.—*Enteric Fever; its Prevalence and Modifications, Etiology, Pathology, and Treatment, as Illustrated by Army Data at Home and Abroad.* By FRANCIS H. WELCH, F.R.C.S., Surgeon-Major, A.M.D. (*Alexander Prize Essay*, December, 1881, modified.) 8vo. pp. 190. Philadelphia: Presley Blakiston, Son & Co., 1883.

As a contribution to the subject of enteric fever from an unusual source, the present volume has peculiar value. The great mass of facts concerning this disease are the results chiefly of the labours of medical men in civil life in Europe and the United States. The natural history of the disease, its course, duration, termination, its symptomatology, its complications, the average death-rate, have come, during the years that have elapsed since Bretonneau, Chomel, and Louis made it known, to be familiar knowledge. It is to be confessed that the ancient clouds overhang its etiology and treatment; yet, even upon these, light appears to be about to break. In private and in hospital practice we know it to be substantially the same disease. We recognize its conformity to type under the various forms that it occasionally assumes, and we have come to regard it as the great fever of the present day, just as the plague was the great fever of the middle ages, and typhus the great fever of the period intervening between the termination of that historical period and the present. But en-

teric fever is by no means a disease of limited prevalence. It is of the widest geographical distribution, having been encountered in all countries and in every climate. Hirsch concluded, however, that its general prevalence in Europe and America dates no further back than the second and third decades of the present century—that is, from the period at which typhus (der Petechialtyphus) became less common, and in part disappeared altogether. It is certainly true that enteric fever has within the last two decades become endemic at many widely separated points in both hemispheres, where it was previously not an unrecognized, but an altogether unknown disease. To observers in the old countries, questions as to the behaviour of the disease in its new habitats naturally arise. What are the effects upon it of climate, of altitude, of unaccustomed soils, and modes of life? Are there modifications of intensity, of duration? Are there regions especially favourable to the development of this disease, or are there localities blessed with a relative or absolute immunity from the action of its infecting principle?

The author, investigating enteric fever from the standpoint of the military surgeon and basing his deductions upon the army data of the British service, seeks to show the relation of the disease as it is known in England, which is in fact as it is known to us, to that of the world at large.

We learn with surprise that, prior to 1859, enteric fever was returned with other forms of febrile diseases under the generic term "continued fevers." From that date most of the stations return it as "typhoid," and since 1869 it has been returned as "enteric."

Between 1859 and 1878—the author's statistics appear to be limited to this period—the white troops suffered fron this disease in every quarter in which they were called upon to serve, except Newfoundland, British Columbia, west coast of Africa, and the Fiji Islands, a single case only having been returned during that period from St. Helena. Native troops at the stations where they are employed have also suffered from it, but in diminished ratio.

In temperate climates, the conditions are "less favourable to the production" of enteric fever than in tropical or subtropical stations. When the disease occurs in the latter the tendency is to greater severity of type, and a higher proportionate death-rate. The elevated stations of India are not exempt, and the mainland of India suffers to a degree second only to that of the Mediterranean littoral and the tropical islands of the Western Hemisphere. Unfortunately, the statistical material for comparison with high northern latitudes is very limited. Nova Scotia suffered in 1865 from a serious outbreak. In Canada the ratio from 1862 to 1869 was extremely low. Marked differences in the prevalence of the disease in stations approaching each other in climate and in the same stations in different years are noted—an observation in accord with our knowledge of the influence of local conditions, but not at all vitiating the importance of the general statement concerning the effect of climate upon the prevalence and intensity of the disease. It would appear that in tropical countries the access of enteric fever is more commonly marked by chill than with us; that the eruption is less common, not having been clearly distinguished by the author from insect bites, etc., in more than one-half the cases, about the proportion of reported cases generally; that splenic enlargement is less common than with us; that albuminuria is comparatively less frequent, and that the variations in the temperature curve are by far greater.

The author sums up an elaborate study of the collected facts as to the prevalence and introduction of the disease in the home and foreign stations, and an exhaustive inquiry into the predisposing influences, in these words:—

"Not only is the disease similar throughout the service, but the service disease is the same as the civil European; the military details give support to the civil deductions, and *vice versa*."

The conclusion he reaches as to the exciting cause is:—

"That the specific theory more closely embraces the military data than any other, and is the only one that meets the requirements of the facts."

The sections on pathology and treatment are well up to the times. They do not call for detailed consideration, for the reason that they embrace nothing that can be said to be peculiar to the military point of view. The author lays no stress upon a specific plan of treatment as such, a subject that bids fair to attract more attention in the future than it has yet done. He attaches to the subject of the disinfection of the clothing and excreta the importance it merits, and expresses a well-grounded disbelief in the efficacy of the measures commonly employed. Without being otherwise explicit, he suggests for this purpose the use of heat "to the boiling-point." It would be better to make the heat greater for clothing, and to mix the stools with sawdust and burn them, an old method, which does not appear to have been brought to the notice of the author.

That which strikes us as by far the most important among the differences between enteric fever as we know it and enteric fever among British troops, is the difference in the death-rate. The former, from vast collections of cases by different observers, shows a mortality of 15 to 20 per cent., whilst the average proportion of deaths to cases in the latter is above 33.3 per cent. In some districts (foreign stations) the mortality reaches 50 per cent., and in a few localities—Mauritius, Ceylon, China, Bombay—it considerably exceeds the half of all cases (pp. 4, 117).

The author discusses many of the conditions to which this unfortunate result is due, incidentally, but with much force. So far as the scope of his book warrants, he also considers the subject of the prevalence of enteric fever in the civil populations at the various stations.

The book is a readable one, and widens the view of the subject of which it treats—a subject which is of sufficient importance to-day to give value to every well-considered contribution to its literature. J. C. W.

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ART. XXXI.—*Epitome of Skin Diseases, with Formulæ for Students and Practitioners.* By the late TILBURY FOX, M.D., F.R.C.P., and by T. COLCOTT FOX, M.B., M.R.C.P. Third American Edition, revised and with additions. By T. COLCOTT FOX, B.A. (Cantab.), M.B. (Lond.), etc., 12mo. pp. 240. Philadelphia: Henry C. Lea's Son & Co., 1883.

THAT this little book should have reached a third American edition, in the face of competition from several native productions of a similar scope

is a strong testimony in favour of its practical and popular character. The late Tilbury Fox was a very forcible writer, and all that he wrote bore the impress of his personality, and carried the weight of his individual experience. In the present edition, Mr. Colcott Fox has, while preserving the unity of the work, made numerous minor changes, most of which add to the conciseness of the text, while they necessarily detract somewhat from its attractiveness of style. The pages on the pathology of skin affections have been omitted in this edition, and the description of the various primary and secondary lesions has been considerably condensed. The classification of the American Dermatological Association which has been interjected by the American editor, though excellent in itself, is incongruous, and the more so because quite different from that given by the authors a few pages previously.

The individual diseases are arranged in alphabetical order, a plan which we objected to in our notice of the last edition of this work, but to which we are now inclined to give our adhesion, because it is most convenient for hurried reference. A large number of affections find their place in the list for the first time in this edition, while numerous cross references facilitate the use of the book by one unaccustomed to the synonyms of dermatology. Among the diseases described for the first time in this edition we find *anæsthesia*, *angioma pigmentosum et atrophicum*, *anidrosis*, *bromidrosis*, *chromidrosis*, *dermatitis*, and *dermatolysis*. The name elephantiasis is confined to the connective tissue hypertrophy always known as *elephantiasis arabum*, while leprosy is very properly found under the title *lepra arabum*, thus avoiding the possibility of confusing two entirely different affections. Other affections described for the first time are *fragilitas crinium*, *frambœsia*, *grangrene of the skin*, *melanoderma*, *nævus*, *vaccinal eruptions*, and *verrucæ*. Some articles, as that on lichen in its various forms, and on the treatment of ringworm, have been considerably augmented, and in fact there is scarcely a page which has not felt the hand of the reviser. The generous reference to the work of others always so characteristic of the late Tilbury Fox, and which brought in the names of a very large number of those writers on dermatology, whose labours had been utilized, has not been continued in this edition—perhaps this was hardly possible in so small a book. The formulary at the end has been thoroughly revised and enlarged. A. V. H.

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ART. XXXII.—*The Principles and Practice of Medical Jurisprudence.* By the late ALFRED SWAINE TAYLOR, M.D., F.R.S. Third Edition. Edited by THOMAS STEVENSON, M.D. Lond. Two vols. 8vo., pp. xx., 727; xiv., 657. Philadelphia: Henry C. Lea's Son & Co., 1883.

DR. STEVENSON, as the successor of Dr. Taylor at Guy's Hospital, and officially recognized as an analyst of skill and experience, is the proper person to issue the larger work on legal medicine which his predecessor gave to the world.

For years Dr. Taylor was the highest authority in England, upon the subject to which he gave especial attention, correlatively his experience

was vast, his judgment excellent, and his skill beyond cavil. It is therefore well that the work of one who, as Dr. Stevenson says, had an "enormous grasp of all matters connected with the subject," should not be permitted to lapse into the list of old books, but be brought up to the present day and continued in its authoritative position.

To accomplish this result Dr. Stevenson has subjected the work to most careful editing, bringing it well up to the times. In doing this, the editor has found it necessary to condense some parts of the book and entirely rewrite others. By so doing he has been able to keep the work within its former limits, and at the same time to incorporate in it some of the more recent and important cases.

How well this has been done may be instanced by referring to the sad case in which Dr. Lamsen used aconitine for the destruction of his brother-in-law, of which the important details are given by Dr. Stevenson. A comparison of this with former editions will show that the number of cases has been increased, and that the work of a careful and conscientious editor is manifest in both volumes.

Excepting for the references to this JOURNAL there seems to us to be too little recognition of the work done in this country.

This treatise is certainly entitled to preserve the high rank it has attained, and will not be readily superseded as an authority in Great Britain, yet there would seem to be room for another work, treating the subject in a different way. As at present constructed, works on medical jurisprudence aim too much at making legal doctors, rather than medical experts. There is an array of legal knowledge with a citation of authorities and reported cases, which are both formidable and confusing to the average physician. At the same time, and to satisfy the exigencies of the construction of the book, the cases are too often given merely in abstract. In this way the interest which always attaches to detailed narrative is in great measure lost, while the multiplicity of references tends to leave only an indefinite impression upon the mind of the reader. We take it that the detailed narration of a comparatively small number of cases, and the mere reference to others by title either in foot-notes, or in an appendix, would make a most interesting and a most valuable contribution to medical literature. With such a selection of cases the principles which must guide the medical expert could be incorporated, and though it might not be available as a legal text-book, it would help to make its readers good observers and reliable medical detectives, which after all is the proper function of the medical expert. Such a detective will not trouble himself about legal points or precedents, but will aim at observing everything which will aid him in making a diagnosis of the case. He will approach each case, as he would one of intricate disease, and, after observing, formulate his diagnosis and be able to explain to any intelligent mind the steps by which he had arrived at his conclusion.

While we have thus ventured to express our opinions as to the need of another kind of book, we desire to add our testimony to that of others as to the value of this one, and to congratulate its editor upon the successful manner in which he has accomplished a delicate and difficult task.

S. A.

ART. XXXIII.—*Clinical Lectures on the Diseases of Women, delivered in Saint Bartholomew's Hospital.* By J. MATTHEWS DUNCAN, M.D., LL.D., F.R.S.E., President of the Obstetrical Society. Second edition, much enlarged, with appendices. 8vo. pp. 442. London: J. & A. Churchill, 1883.

IN this volume we are presented with a much more extensive range of subjects than in the first edition, which appeared in 1879, the number of lectures having been increased from nineteen to thirty-five, to which has been added an appendix containing seven short papers. This addition has been dedicated to Mr. Joseph Lister, of world-wide fame, the former having been inscribed with the name of Prof. Fordyce Barker, of New York.

Dr. Duncan, by his lectures and numerous contributions to medical science, has obtained a world-wide reputation as a teacher, close observer, and practitioner. Well read in his special branch, and having had a large experience, his writings are peculiarly practical in character, and illustrated by reports of cases which have been under his own care. His lectures have been largely read in this country, and his opinions are well known here: they have also appeared upon the Continent in Italian, German, and Russian.

Although by no means a complete treatise, the subjects have been well chosen, and are mainly medical in character, the object being to teach the diagnosis and treatment of the diseases of women, to be encountered in the daily practice of the physician, rather than of the surgeon-gynecologist. As a teacher, Dr. Duncan is very positive in his views, leaving nothing in doubt as to his position on a question at issue: in fact he has sometimes been thought to allow a pre-conceived prejudice to bias his opinion against a new method, as he is credited with, in regard to Emmett's operation for lacerated cervix uteri, which he has strongly opposed without a trial, although others of his countrymen having such a prejudice, have been convinced of their error after a careful investigation of its curative value. Aside from all this, the reputation of Dr. Duncan was established long before he left Edinburgh for London, and it was the position he then held before the world that procured him the chair he now so well fills, and elevated him, a stranger, to the presidency of the Obstetrical Society of London.

We shall hope to see at a future day a more general gynecological treatise, arranged in a different form, from the pen of Dr. Duncan; and in the mean time have only to recommend the volume under review as a valuable treatise for the library of the physician. R. P. H.

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ART. XXXIV.—*Elements of Surgical Pathology.* By AUGUSTUS J. PEPPER, M.S., M.B., F.R.C.S., etc. Illustrated. 16mo., pp. xii., 503. Philadelphia: Henry C. Lea's Son & Co.

THE author of this little hand-book tells us in his preface that his aim has been to supply what has long been felt as a desideratum, a small work

on surgical pathology suited to the requirements of students preparing for the final examinations. This undertaking, far from being an easy one, demands a degree of skill which is not the possession of every one who may have the inclination to make such an attempt. The subject is large, and it is hard to bring it within the compass of so small a book as the student can go over rapidly under the pressure of approaching examinations. In the matter of compression, however, the author of the book before us has done very well. But another feature of more importance than condensation in a text-book is reliability. The student preparing for examination ought to be given not only what he can quickly swallow, but also what he can readily digest and profitably assimilate. In these regards we do not think the author has done quite so well as in that first mentioned. Of course we are aware that a book of this sort is not the place for the discussion of mooted pathological questions, that the occasion calls for brevity and positive statement; and it may be the author could, if he had the space, defend the very opinions which least coincide with those of his critic. None the less is it the duty of a critic to indicate what may strike him as susceptible of improvement in the matter of any book that comes under his notice. The same may be said in relation to the form of a book. The author may think it so reasonable and so plain that one must be stupid not to find it easy to understand, while the critic may think very differently. Yet here again the critic must use his own judgment, not the author's, and take the responsibility of his own fallibility. In regard to the book before us, we may premise by saying we find much to commend in it. It is sufficiently clear and explicit in many respects, and manages to include a great variety of pathological conditions in its small space. Some of these are treated in a perfectly satisfactory way. But there are others the teaching in regard to which might be improved, and some about which the statements of the author appear to us quite erroneous. If we consider first the arrangement of this work, we do not see why "suppression of urine" should be put between "idiopathic pyæmia" and "erysipelas," and in the chapter on "septicæmia and pyæmia." Nor, again, why "tetanus" should come between "lupus" and "union of wounds." If we attend to the matter of the book we are stopped by the expression "micrococci, bacteria, etc.," which certainly would not lead the student to suppose that micrococci are a subdivision of bacteria. Again, we ask ourselves, is the author justified, in view of the form of pain in felon, in making the distinction that "aching" pain is "symptomatic of tension beneath very resisting structures"? And, is it true that throbbing pain depends on softening of the tissues and the allowance of "considerable latitude for expansion of the vessels"? Turning to the chapter on ulcers, we find that syphilitic ulcers are said to be of two kinds, "infective and non-infective, indurated and soft." This is not only contrary to fact—for, whether unicists or dualists, all syphilographers agree that every syphilitic sore is infective—but it is also contrary to what the author himself states in the chapter on syphilis, where he plants himself pretty squarely on the platform of dualism, and shows that he knows the difference between what is and what is not syphilis. Unfortunately, however, this chapter on syphilis is one of the worst examples of bad writing which his book affords, and hardly redeems him from judgment for the misstatement in a previous place, which might be set down to an inadvertence.

But we must not take up too much space in vindicating the intimation that the author has not all through his book furnished the student with pabulum of the most digestible and most nutritious sort. It strikes us

that, in certain places, his expressions indicate that he has no very great personal familiarity with the subjects of which he speaks. If this be true, we can understand—but not otherwise—why in regard to gonorrhœa he allows himself the timid expression: "Constitutional infection is the chief sign of a specific disease, and in the great majority of cases gonorrhœa is a purely local disorder."

The chapter devoted to urinary deposits and calculi is most incomplete and unsatisfactory. It might do for a student who only needed a little hint, to be told that the "characters" of "carbonate" are "small and delicate crystalline spherules, drum-sticks." But what would he do if he looked for the characteristics of uric acid, and could not find them, unless he chanced upon them as the "crystalline form" of "urates or lithates of ammonia and soda"? And how would he miss all mention of tube-casts! (An explanation of the author's defects in this chapter is furnished by the foot-note in which we are informed that he has here borrowed from that other defective "grinder" for students, Keetley's "Index of Surgery.") In the chapter on the carcinomata, we find, after much that may be praised, and when we had hoped to escape the need for finding fault, the following sentence, which may be intelligible to the author, but which we find not quite clear: "Dr. Thin has shown that beneath the basement membrane of duct cancer there is a delicate feltwork of interlacing elastic fibres, similar to that described by Henle around the milk ducts of the breast."

And thus we have reached the end of this book. With regret we have had to speak in no very laudatory terms of some of its features, yet it has merits which deserve that they should at some future time be delivered from the drawbacks which impair their usefulness. The general plan of the book is good, though the arrangement might be improved, and so might be the wording of many of the sentences; certain conditions might be treated of more fully, and others might be curtailed, without loss; but the excellent illustrations could hardly be bettered, the typography is very good, and the handy size and shape are to be commended. C. W. D.

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ART. XXXV.—*The Treatment of Acute Rheumatism; An Analysis of the Results obtained under different Systems of Treatment in Saint George's Hospital during the years* 1877 *and* 1878. By ISAMBORD OWEN, M.D., Lecturer on Materia Medica and Therapeutics, etc. etc. Quarto, pp. 28; tables viii. London: J. & A. Churchill, 1883.

THIS thesis is an admirable example of the clinical method of investigating the value of remedies. It consists of an analysis of 210 attacks of acute or subacute rheumatism occurring during the course of two years in 202 patients, and treated by different methods in Saint George's Hospital. The cases were treated by the members of the staff, but the records were made by the author, as Medical Registrar, and under conditions favourable to uniformity of observation and accuracy of the results.

In 85 cases the primary attack was treated with sodium or ammonium salicylate, in doses amounting at first to *three drachms or more* for the adult in twenty-four hours. This amount was reduced as soon as the required effect was produced, or toxic symptoms appeared. In 49 of these

cases full doses of alkali (potassium bicarbonate or potassium citrate in sufficient amount to render the urine alkaline) were given along with the salicylate.

In 52 cases the salicylates were given in doses amounting at first to two drachms in twenty-four hours. These doses were reduced as occasion required. In 38 of these cases full doses of alkali were given along with the salicylates.

In 19 cases the salicylates were given in doses not exceeding one-and-a-half drachms in twenty-four hours. In all but four of this group full doses of alkali were combined with the salicylates.

In 29 cases the primary attack was treated by full doses of alkali, alone or in combination with quinine.

In 6 cases the drug used was potassium iodidi, alone or combined with the alkali, guaiacum, bark, or sarsaparilla.

In 19 cases the treatment originally adopted was changed for another before the termination of the primary attack.

The cases are classified with reference to the degree of pyrexia and the presence or absence of marked swelling or redness about the joints. Due consideration is given to the duration of the case before coming under treatment and to the length of the convalescence. For the author's ingenious method of presenting these cases in tabular form the brochure itself must be studied. The conclusions are of great practical importance. They are as follows:—

"The duration" (under treatment) "would appear to be independent, both of the character of the cases (as far as defined in the classification) and of their previous duration."

"The primary attack, after the commencement of treatment, was about half as long under salicylate as under full doses of alkali."

"In administering the salicylates, an advantage is gained, in shortening the total duration of the case, by restricting the initial doses, and by combining with them full doses of alkali."

In respect of actual suffering, it appears that—

"All the modes of salicylate treatment show a marked advantage when compared with the results of alkaline treatment."

"The advantage was least marked when the salicylate was given in large initial doses without alkali, and hardly more so when the salicylate was given in small doses."

The best results were obtained in respect of suffering, as in respect of duration, by the combined alkaline and salicylate treatment.

The information afforded by these cases, as to the influence of the salicylates in cardiac complications, is slight.

No support is given to the view that permanent damage to the kidneys results from the use of the salicylates; but it is more than probable that transitory albuminuria during the febrile state is favoured by their employment.

Toxic effects were produced in 23.5 per cent. of the cases in which the salicylates were given in initial doses of three drachms or more in twenty-four hours; in 13.5 per cent. where the amount was two drachms, and in 10.5 per cent. where it did not exceed two-and-a-half drachms.

The most frequent symptoms of the poisonous effect were delirium and vomiting. Among the rarer manifestations were deafness and tinnitus aurium, mental excitement, tremor, shivering, giddiness, and papular and pustular rashes. J. C. W.

ART. XXXVI.—*A Treatise on Syphilis in New-born Children and Infants at the Breast.* By P. DIDAY, Ex-surgeon to the Hospital de l'Antiquaille, Lyons. Translated by G. Whitley, M.D. *With Notes and an Appendix* by F. R. STURGIS, M.D., Professor of Venereal and Skin Diseases in the New York Post-Graduate School, etc. 8vo. pp. xii., 310. New York: William Wood & Co., 1883.

TWENTY-FIVE years ago the New Sydenham Society translated and published in England the excellent treatise of M. Diday on Infantile Syphilis. This year this translation has been taken, and with the addition of certain brief notes, and a very short appendix by Dr. Sturgis, has been put out as a member of the "Library of Standard Medical Authors," with the title on the back "Hereditary Syphilis, Diday and Sturgis."

There is no need at this late day to make a review of the work of M. Diday. It has been long before the medical public, and has won the esteem of all students of syphilis, even though the views of the author have not all stood the test of time and further investigation. The work is truly a classic, and no one ought to attempt to treat the subject without learning what is in it. Unfortunately for those who cannot read French, it was published in England as one of a set of books, and it is not always easy to lay one's hands on a single number of these. The same misfortune attaches to this present republication. It is one of a set, and single numbers are not on sale.

The volume before us has all of the merits of the English translation, and is somewhat improved by the brief notes and meagre appendix which Dr. Sturgis has contributed. The improvement, however, is not sufficient to prevent a feeling of regret that when the profession was given a reprint of the New Sydenham Society's book, it was not given just as it was, and that Dr. Sturgis has not carried out his original intention to write a work of his own on this subject. C. W. D.

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ART. XXXVII.—*Experimental Pharmacology. A Handbook of Methods for Studying the Physiological Action of Drugs.* By L. HERMANN, Professor of Physiology in the University of Zurich. Translated with the author's permission, with notes and additions, by Robert Meade Smith, M.D., Demonstrator of Physiology in the University of Pennsylvania. Pp. 201. Philadelphia: Henry C. Lea's Son & Co., 1883.

THE study of pharmacology, that is, the application of the exact methods of physiology to the investigation of the effects of drugs upon the animal economy, has proved of double value, inasmuch as it has on the one hand explained the actions of these drugs on the body—its prime object—while secondarily it has thrown much light on the physiological phenomena incidental to its prosecution. It is a study too in which very accurate results may in many cases be obtained, and as its directly practical bearings are often plainly visible, it is that branch of physiology which in this country has perhaps met with more favour than any other.

Prof. Hermann's handbook, which Dr. Smith has translated and enriched by many valuable additions, will therefore be gladly welcomed by those engaged in this department of physiology. It is an excellent little

book, full of concise information, and should find a place in every laboratory. It explains the various methods and instruments used, and points out what lines of investigation are to be pursued for studying different phenomena, and also how and what to particularly observe. It is divided into two parts. In the first the study of the action of poisons upon isolated organs is considered, while in the second their general action is treated of. The book is enriched with many illustrations taken for the most part from the larger works of Cyon, Sanderson, and Foster.

W. M.

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ART. XXXVIII.—*The Diseases of Women; a Manual for Physicians and Students.* By HEINRICH FRITSCH, M.D., Professor of Gynæcology and Obstetrics at the University of Halle. Translated by Isadore Furst. 8vo., pp. vi. 355. New York: William Wood & Co., 1883.

IN Fritsch's Manual in its present form the English reader has the advantage of an excellent and concise statement of the subject upon which it treats from the German standpoint. It is particularly good in the manipulative part, and if there are any differences between an American or English and a German manual upon Gynæcology, it lies in this direction. Manipulations are clearly described, and, considering the form of the reprint, well illustrated. The author is surrendered to the germ theory, and throughout the book antisepsis dominates every procedure. No one can find fault with this, as antisepsis is but another name for clean surgery, nor should one expect in a treatise of this character to find disputed subjects alluded to at any length; but moderation is a virtue as well as cleanliness, and it would have been as well to let the reader have some hope for success in gynæcological operations beyond the boundaries of Listerism. It is a fair sample of the author's extreme position to quote a sentence. In preparing a patient for a laparotomy, after a series of disinfecting baths, he says that he has thought himself "justified in giving besides evacuants also disinfecting internal remedies." The translator's word "remedies" may not exactly give the meaning of the original, but it is near enough to show the author's idea of what are termed antiseptic precautions. We welcome the book for the single reason that methods are taught free from the defects of prejudice that do so much to impair the value of some of our best native hand-books, and thus will diffuse a broader and more healthy feeling upon points that in this country are in debate. The very absence of individuality in the author's style will still more contribute to this end. A few things are noted that may be dissented from, but not in important matters. For instance, to the student it cannot be a very important matter that Trenholm instead of Battey is mentioned in connection with castration, nor would it be mentioned in this notice except that it shows that even the most liberal author may have, in fact nearly always has, here and there in half-concealed nooks bits of feeling that will crop out. Of course Fritsch knows as well as we do ourselves the history of this operation.

It is unnecessary to follow the author through the book, as the arrangement is purely conventional, diseases of the pelvic organs, with their pathology, causes, symptoms, and treatment, following to the close of the volume, after the first five chapters of general introductory matter, which are the most interesting parts. The Manual is one worthy of the author and translator, and speaks well for the good judgment of the publishers.

E. V. DE W.

# QUARTERLY SUMMARY

OF THE

# IMPROVEMENTS AND DISCOVERIES

IN THE

# MEDICAL SCIENCES.

## ANATOMY AND PHYSIOLOGY.

*Innervation of the Cardiac Portion of the Stomach by the Pneumogastric.*

Dr. Theodor von Openchowski, of Kieff, gives the following as the conclusions drawn by Professor H. KRONEKER on this subject: 1. The cardia of rabbits is innervated by the pneumogastric, the right sending a branch to the anterior part of the œsophagus, the left to the posterior part, branches being also sent to Auerbach's plexus in the stomach; this plexus also receives sympathetic filaments from the mesenteric ganglia. 2. From Auerbach's plexus, which contains multipolar ganglia, net-like fibres are distributed to the muscular structure of the stomach and cardia, so that the plexus is an intermediate centre in relation with which are the vagal respiratory sympathetic centripetal fibres, which represent centrifugal tracts to the muscular structure. 3. The pneumogastrics also send small fibres to the small collections of sympathetic ganglia which are dispersed over the cardia. 4. Attached to the larger branches of the pneumogastric, lying in the cardial region, are large many-celled (some containing so many as twenty cells) ganglia. Eight such groups were found attached to the right vagus, and three large collections to the left.

This anatomical distribution becomes intelligible through the following physiological facts: 1. The divided cardia (of frogs) can perform automatic contractions for hours. 2. In living rabbits the unirritated cardia remains at rest; after death, as is well known, it makes rhythmical contractions (cardial pulse). These contractions can be observed on the living animal if the cardia is rendered anæmic by ligating the cœliac artery. 3. The cardia cannot be made to contract by isolated induction blows, by which the vagus is irritated. 4. Strong induction blows, at intervals of one-third of a second, cause feeble contractions of the cardia after from one-half to two seconds. 5. Frequent irritations, of moderate intensity, at intervals of one-twelfth to one-thirtieth of a second, cause contractions; of slight intensity cause expansion of the cardia. 6. Frequent irritations of considerable intensity (intervals of one-fiftieth to one-sixtieth of a second) cause also feeble expansion of the cardia. 7. Irritations, sufficient to cause opening of the cardia, often do not give any evidence of vagal action in the registered heart beats. 8. It is necessary to recognize that the cardia, under the conditions of the experiment, is generally found in a condition of considerable tonus, which can

be decreased by retarded innervation. 9. This retardation can be obtained by electric tetanization of the vagi, by accelerating respiration, or by local venous engorgement (constricting the portal vein) 10. Such contractions are stronger after section of the vagi in the neck, and do not cease when the splanchnics are divided in the abdomen. 11. If all the vagal branches which do not directly supply the cardia, are divided, one obtains, through electrical stimulation of the vagi by a power current, a strong expansion of the cardia, this decreasing excitability lasting a long time. 12. If one succeeds in destroying the cardial fibres, while the fibres of the stomach are left intact, irritation of the vagi will produce closure of the cardia with every strong current. This function is easily exhausted, but soon returns to its former state. In this way special constrictor nerves of the cardia are recognized. 13. After interrupting all sympathetic connections between the abdominal ganglia and the stomach the above phenomena remain unaltered.—*Centralb. f. die med. Wissensch.*, Aug. 4, 1883.

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### *Uterine Milk.*

A recent number of the *Zeitschrift für Geburtshülfe und Gynäkologie* contains an article by Dr. G. VON HOFFMANN, of Wiesbaden, in support of the doctrine advocated by Ercolani, and to a certain extent by Dr. Braxton Hicks, viz., that the fœtal villi in the placenta do not float naked in the maternal blood, but are surrounded by cells whose function it is to secrete a special fluid serving for the nutrition of the fœtus, and called uterine milk. Dr. von Hoffmann believes that he has been able to extract this fluid from the human placenta. His method is simply this—he takes a quite fresh placenta, which has not been allowed to come into contact with water, and lays it with its maternal side uppermost. A cotyledon, the integrity of which has not been damaged, is then selected, and carefully dried with a sponge or towel, so that no blood adheres to it, and into a capillary tube is then pressed, so that it may penetrate about one third or half an inch. The tube thus used pushes the villi aside, and lies in the inter-villal space. It is important in inserting the instrument to see that no bloodvessels are injured by it, lest blood be effused between the villi. When a capillary tube is employed in this manner it sucks up the fluid from the inter-villal space (*i. e.*, the uterine milk), which can then be collected and examined. Dr. von Hoffmann has examined the fluid from about forty placentæ, some at term, others from cases of absorption at different months. Microscopically, he finds in it the following constituents: 1. Red blood-corpuscles of different sizes and depth of colour, often, especially in placentæ of the earlier months, with little or no tendency to aggregate into rouleaux. 2. White corpuscles. 3. The chief structures contained are what the author calls "uterine milk-globules," peculiar, clear, round globules, having a very thin, feebly refracting wall, on the average about as large as white corpuscles, but varying from a tenth of, to twice, their size. These bodies precisely resemble those seen in "uterine milk" obtained from the placenta of the cow. 4. Clear watery intercellular fluid. The above-described "uterine milk-globules" are present in such numbers that Dr. von Hoffmann calculates that each cubic millimeter of the fluid contains 180,000 to 200,000 of them. 5. There are also found free decidual cells and pigmentary molecules, granules, and flakes of different shapes and sizes, which our author regards as products of the disintegration of red blood-corpuscles. Fluid such as this, Dr. von Hoffmann states, can be extracted from every healthy placenta; if it is wanting, the placenta is not healthy. He believes, moreover, that he has traced the mode of formation of these "uterine milk globules" from decidual cells, and the production of the large decidual cells from the many nucleated "giant-cells" of the decidua.

Dr. von Hoffmann's views as to the physiology of fœtal nutrition are summed up in the following propositions: 1. The general office of the decidua, both in animals and in man, is to supply the fœtus during its intra-uterine life with a part of the nutritive material necessary for its growth. To fulfil this function the decidua serotina becomes a special milk-secreting organ, which, after the birth of the child, is expelled with, and as an integral part of, the placenta. 2. The secretion of this organ, the so-called uterine milk, is separated into gradually formed spaces, in which lie the placental tufts. Here the uterine milk is mixed with maternal blood, which is at the same time extravasated, and together with it forms the material for nutrition of the fœtus, this material being only suited for absorption by the placental villi when these changes have taken place. 3. From the point of view of the comparative anatomist, it can no longer be maintained that there is any essential difference in this respect between the placenta of man and the higher animals. Dr. von Hoffmann promises a further communication in which he will elucidate the mode in which this uterine milk is absorbed by the placental tufts.—*Med. Times and Gazette*, Nov. 24, 1883.

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## MATERIA MEDICA AND THERAPEUTICS.

### *Cotoin and Paracotoin.*

Cotoin and paracotoin are two but little-known medicinal agents to which Albertoni has recently given some fresh attention (*Archiv für exp. Path. und Pharmac.*, Sept. 1883). Eight years ago the bark called coto-coto was first brought to England from Bolivia. Of its origin nothing further is known. Two kinds of bark are described, coto verum and paracoto. The chemical composition of cotoin is represented by the formula $C_{22}\,H_{18}\,O_6$, which is the active constituent of coto verum. According to Burkart, the subcutaneous injection of one gramme of cotoin into rabbits gives rise to no effect. Pribram believes that this substance possesses antiseptic properties, and he has recommended its use in small doses for some cases of diarrhœa in children. Albertoni finds that repeated small doses increase the appetite of healthy men without causing unpleasant sensations and without producing constipation. Subcutaneous and intravenous injections of alkaline solutions of cotoin performed on rabbits and dogs were followed by no remarkable phenomena. No influence is exerted by this agent on the process of digestion. It does not become dissolved in the gastric juice, but passes unchanged into the intestines. There can be no doubt that the principle is absorbed and excreted by the urine, as Albertoni proved on himself. The characteristic secretions of cotoin consist in the appearance of yellow coloration with alkalies, red tint with nitric acid, and brown-golden with sulphuric acid. Investigations were also made to determine the influence which cotoin might exert on the process of decomposition, either in the intestines or outside the body. Taking the excretion of indol as the guide, it was discovered that during the administration of the drug phenol did not disappear from the urine. Nevertheless, Burkart and Pribram are right when they assert that in cases of diarrhœa under the medicinal use of cotoin the indican in the urine falls off. But Albertoni contends this is a secondary effect which depends on the cure of the intestinal lesion. From other artificial experiments the conclusion is arrived at that cotoin is not able to hinder putrefaction in the development of bacteria either in or outside the animal organism. Injections of solutions of cotoin into

the jugular veins and other experiments went to show that cotoin could determine an active dilatation of the vessels of the abdomen. No other substance has yet been shown to possess a similar action on the vessels of the peritoneum and of the intestines. Salvioli found by the artificial circulation of opium tincture that the quantity of blood flowing through the intestines was increased. Mosso has told us that chloral exercises a similar effect on the renal circulation. The vascular dilatation appears to be due to a paralysis of the muscular coat in the last two instances. As a matter of fact, opium and chloral lower the blood pressure, and after some time the circulation may cease. Paracotoin is a weaker cotoin in its physiological action. Therapeutically cotoin was found to be of value by Albertoni in cases of diarrhœa met with in the various forms of mental disease in chronic intestinal catarrh, in looseness of cachectic states, in the relaxation of pelagra, phthisis, and rickets. Cotoin is contraindicated in states of severe hyperæmia of the intestines, and where a tendency to melæna exists. Larger doses (from fifteen to twenty centigrammes per diem) were thought to be of more efficacy than smaller ones. The powder in capsules or emulsion, with gum, etc., may be ordered, or a solution in carbonate of soda with water and glycerin. Fronmüller thought that the colliquative sweating of consumptives was relieved by the drug. Paracotoin acts pretty much in the same way as cotoin. The combination of magistery of bismuth with cotoin, it is suggested, will be found to be of special value.—*Lancet*, Oct. 20, 1883.

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*Investigations into the Action of the Digitalis-Group.*

At a meeting of the Royal Medical and Chirurgical Society on November 27, Dr. SIDNEY RINGER read a paper on this subject. Digitalis was taken as the type of a group of drugs whose influence was exerted mainly on the circulatory system. The facts of chief importance in this action were: 1. the arrest of the heart in systole (if the dose were sufficiently large); 2. the raised blood-pressure which obtained throughout till close upon the final systolic arrest. Whilst the spasm of the heart was universally recognized as the result of the digitalis-action, and as caused by direct action of the drug on the cardiac tissue, there was doubt both as to the condition of the arterioles under the influence of the drug, and as to whether the influence was direct or indirect. The action of digitalis upon the heart might be thus defined: as the production of continuous spasm of the heart-muscle by direct action of the drug on this tissue. It was pointed out that this spasm could not be of the nature of a tetanus, *i. e.*, of a fusion of adjacent beats, and, further, that it might affect either the whole heart or a limited portion of the same, according as the drug was applied to the whole heart or to a limited portion. Thus defined, the already very large group of bodies classed by Schmiedeberg under the heading digitalis became yet larger, and would include, amongst others, the caustic alkalies and barium salts. Experiments were recorded in which an artificial saline solution was circulated through the vessels of the hinder extremities of a tortoise whose brain and spinal cord had been completely destroyed. The experiments were so arranged that the rate of flow could be measured; and so soon as a uniform rate of flow had been established, the drug was added to the circulating fluid. The results obtained with digitalis were both uniform and striking; invariably, on the addition of the drug, the circulation became slower, even to the extent of almost complete stasis. Similar experiments were made with the following members of the digitalis group: strophanthus, dyak poison, convallamarin, and scillitine. In the case of each of these drugs, evidence of constriction of the vessels was obtained, in the shape of a slowed circulation-rate. Digitaline, however, ranked as by far the most active

of the above. Similar experiments were made with hydrate of potassium, and with the carbonates of potassium, and sodium bicarbonate, which, with the exception of the last, gave like evidence of constriction of the arterioles.

Experiments carried on simultaneously with the above, on the excised heart of a frog, showed, in the case of each of the above drugs, the production of more or less persistent spasm, with the notable exception, however, of sodium bicarbonate, which gave none. Experiments then followed which sought to determine whether the calibre of the vessels, in addition to being directly influenced by these drugs, could be affected by them through the nerves. Digitaline was alone experimented with. The results were purely negative. Finally, to meet the suggestion as to the action of the drugs on the skeletal muscles, experiments were made with frogs, given quantities of solutions of digitaline, strophanthus, dyak, scillitine, barium chloride, and caustic potash and soda being injected. The results showed the first five to be notable muscle-poisons, the muscles rapidly dying and losing their excitability; indeed, even before the death of the animal a very marked diminution of muscular irritability was in several cases observed. Comparing the actions among each other, it was noted that strophanthus and dyak poisons acted much more powerfully on the skeletal muscles than did digitaline.

To sum up, the argument, briefly stated, was as follows: Starting from the systolic digitalis-heart, which was admittedly a result of direct action of the drug on the cardiac muscle, the following conclusions were arrived at: 1. For the other members of the digitalis group here examined, a like action obtained. 2. It was suggested that the local action on the heart might serve as the definition of the action of digitalis; this accepted, Schmiedeberg's already large group must be still further enlarged. 3. Arguing from this action on the muscular tissue of the heart, it was inferred that the action on the muscular tissue of the arterioles would be similar—an inference verified by actual experiment. 4. So far as the experiments went, it was not found that these drugs influenced the calibre of the vessels indirectly through the nervous system. 5. It was pointed out that many of the digitalis-group were notable muscle-poisons, and that the tissue of the heart, standing functionally midway between the striped and unstriped muscular tissues, might permit of the inference that a marked action of the drug on the tone of the heart would indicate a similar effect on the tone of the vessels, whereas a marked action on the cardiac beat would indicate like action on the skeletal muscles.

Dr. Lauder Brunton said he should feel that he was showing best his high value of the paper by pointing out first in what points he was in disagreement with its results. The definition of the digitalis-group was, he thought, too wide. It was a group so large, as to remind him of the two chemical groups of substances which were and were not precipitated by sulphuretted hydrogen. He had himself been engaged in some experiments on the group of substances which stopped the circulation by contracting the arterioles, and found that there were to be included in it many substances, such as cobalt, strontium, nickel, magnesium, and platinum, which were not generally recognized as having this effect. Their influence, however, he admitted, was much less than that of digitalis. His experiments had been carried out on frogs, in which the nerves had been destroyed. The amount of flow through the vessels was estimated by the drops, as they issued from the circulation, falling upon a delicately adjusted lever, and registering their fall by breaking an electric circuit, a method which he had found to work very satisfactorily. In the consideration of digitalis, he thought it important to consider it as a whole in its effects on the heart, the nervous system, the vessels; and, when considered in this way, a smaller group of analogues could be formed, as

Schmiedeberg had shown, from which even veratria must be excluded, in spite of its similar action in many points. In their action on voluntary muscle-fibre, the members of this group showed very different results, varying not only with different species of animals, but also with different individuals of the same species. One frog differed from another in susceptibility, and one cat from another. The causes of this difference he was at present endeavouring to ascertain. That digitalis was not a masked muscular poison, he considered as fairly well established, though even here the results obtained on *rana esculenta* differed entirely from those on *rana temporaria*, as he had had an opportunity of showing about fourteen years ago. The effects of caffeine also differed remarkably in these two species of frogs. The most interesting point in the paper had been the inference, from the action of digitalis on the heart-muscle, that it would have the same effect on the muscles of the vessels, and the confirmation of this, to some extent experimentally, which Dr. Ringer and Dr. Sainsbury had brought forward. It was probable, *à priori*, that the action on the two should be similar, since both heart and vessels were developed originally from a single tube, but it was an inference to be used with caution. That digitalis does contract the arterioles he considered as proved, though it was not universally accepted; some experiments of his own, along with Meyer, in 1867, had shown it, and fresh proof had now been brought forward by Dr. Ringer.—*Brit. Med. Journ.*, Dec. 1, 1883.

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*Narcosis by Chloroform, by Ether, and by Nitrous Oxide.*

NEUDORFER (*Deutsche Zeitschrift für Chir.*, Bd. xviii.) investigates the above, and comes to some highly important conclusions, which may be thus summarized: 1. Air cannot hold more than 20 per cent. of its bulk of chloroform-vapours at the ordinary temperature and pressure. 2. Chloroform acts as a poison upon the red blood-corpuscles, but only slowly, even upon corpuscles at rest, whilst those circulating through the lungs are not long enough under its influence to be destroyed. 3. It has been found by Bernard, Gréhaut, Hoppe-Seyler, and Hermann, that hæmoglobin has a greater affinity for carbon monoxide than for oxygen, and for nitrous oxide than for carbon monoxide. In other words, in presence of an excess of carbonic oxide the blood cannot absorb oxygen, and in presence of an excess of nitrous oxide the blood cannot take up either carbonic oxide or oxygen. Hoppe-Seyler and Gréhaut think that if the weakest of these gases (in their affinity for hæmoglobin) be previously present in excess, it hinders absorption of the gases of stronger affinity. As to this, the authors think that it does not hinder this absorption, but that the latter are thus rendered innocuous, and also that the affinity of hæmoglobin for oxygen is not constant, but varies within certain limits. 4. If to an individual whose hæmoglobin has a relatively weak affinity for oxygen we give to narcosis a mixture of 20 volumes of chloroform-vapour to every 80 volumes of air, he breathes a mixture holding 16 per cent. of oxygen instead of the usual 20 per cent. in the air, and it may happen that he may take up little or no oxygen, and the chloroform may exert its fatal effect. This is a simple and sustained method of explaining death by chloroform. 5. Now, arguing by analogy, since the very poisonous carbonic oxide can be rendered innocuous by the previous presence of other gases in excess, it is to be presumed that in a mixture of chloroform-vapour *and oxygen*, the chloroform could not exert its evil effects upon the blood-corpuscles. 6. There would be no danger of oxygen-poisoning, for the quantity given would be within the limits of the variations of oxygen taken up in nasal respiration. 7. The bad after-effects of chloroform would be done away with. 8. Twenty per cent. of chloroform-vapour would be unnecessary, since three to five per cent.

are quite enough. 9. As to ether it can be mixed up with oxygen up to 43 per cent., but it cannot compete with chloroform, because it possesses no constant chemical constitution, and its behaviour to human tissues is more prejudicial than that of chloroform. 10. The mixture of nitrous oxide and oxygen acts equally as well as the chloroform and oxygen mixture. 11. Oxygen is easily administered by Limousin's apparatus. 12. Narcosis thus caused is absolutely devoid of danger.—*British Medical Journal*, Dec. 1, 1883.

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*Action of Cantharides on the Kidneys.*

Dr. Ida Eliaschoff gives the results of experimental researches on animals with a view to determining the action of cantharides on the kidneys.

The changes found in the kidneys involve the glomeruli and uriniferous tubules. At first there are the characteristic appearances of glomerular nephritis. Whilst the urinary secretion is diminished or completely checked, there appears an albuminous exudation which coagulates on boiling; this is colourless, and contains a few red blood-corpuscles. There is never any certainty that colourless corpuscles have wandered out into the stroma of the kidney; only in the neighbourhood of the medullary papillæ were cells collected in the collecting tubes, which could be considered as wandered leucocytes. The changes of the uriniferous tubules are confined to the glomeruli which resemble those in the collecting tubes of the cortex, in the collecting tubes and ascending loops. They consist in the degeneration of the inner half of the epithelium, which either undergoes direct desquamation or suffers a granular degeneration. Many nuclei are lost and fall into the lumen of the tube; the peripheral part of the epithelium, together with the rest of the nuclei, remains as a small continuous layer in the basement membrane. Of these tubes the ascending loops are the most resisting, changing later than the others. The collecting tubes of the medullary substance undergo simple epithelial desquamation. Eliaschoff has seen fibrin cylinders only once in the medullary substance, because death usually takes place too soon for their formation; but there is scarcely a doubt that loosened granular nuclei containing protoplastic masses are formed later into cylinders in the tubules of the cortex.

Not without interest is the effusion of an albuminous exudation into the cavity of the glomerulus in marked diminution of the watery secretion. The explanation of this must be sought in some trouble of the vascular walls. In the epithelium of the glomerular capillaries no changes could be found. The changes in the uriniferous tubules depend upon the action of cantharides upon the epithelium. But what is this action? Is the cantharides eliminated by the epithelium, and by its passage through the epithelial cells came these changes, or do the glomeruli eliminate it, and the action take place upon the epithelial lining during its passage through the tube? Eliaschoff believes that the drug acts, at least in part, upon the glomeruli. The changes found in the tubes and in the renal epithelium must be attributed to the direct action of cantharides on the epithelial cells. With this knowledge, says Eliaschoff, we must be content for the present.

The first effect of cantharides comes on in about one-half an hour; wandered leucocytes are found, and the exudation of an albumen-containing fluid takes place. Here is to be sought the cause of the diminished urinary secretion. Later, after two or three hours, the uriniferous tubules are affected; the changes are very marked, and may all be attributed to the flowing of the cantharides down the lumen of the tubes.

The changes in the bladder can all be equally attributed to the action of the drug on the vesical mucous membrane. Twenty minutes after venous injection of a sulphindigotate of soda infusion the bladder was found empty and con-

tracted. The kidneys were tolerably blue, and showed, on section, colouring only in the cortex. The boundary line between the cortex and medullary substance, and the medullary substance itself, were of normal colour. Microscopical examination showed that the colouring matter was found only in the injured tubules of the cortex, either in the epithelium itself or in the lumen of the tubules. The colour, however, was much less marked than is the case in the normal kidney.

After half an hour the bladder contained a small quantity of bluish urine, corresponding with which section of the kidney showed a more or less intense coloration of the cortex, and a blue colour of the boundary—and medullary substance. On microscopic examination the colouring matter could be found not only in the injured tubules, but also in the lumen of Henle's loops. Besides, the glomeruli were here either of a diffuse pale colour, or contained the colouring matter in the form of nuclei or deposits; generally between the loops, here and there also between the capsule and vascular convolutions. The kidney examined after one hour had the same appearance as that examined at the end of half an hour, the colouring being confined to the cortex. In both kidneys the coloration was less marked than in the kidney examined at the end of twenty minutes; that is, a greater number of tubules had a slight diffuse colour. After two hours the colouring was still less marked. These experiments showed that the greater the interval between the administration of the cantharides and the sulphindigotate of soda the less colouring matter will be eliminated by the injured tubules.

The difference between cantharides and chromic-acid poisoning can be stated in a few words: In both forms there are changes in the glomeruli and uriniferous tubules. Kabiersky first recognized a wandering of leucocytes as well as blood-corpuscles into the capsule, so that the convolutions seemed to be affected. But this appeared to occur in later stages. Here the changes in the uriniferous tubules are prominent. Here, also, the injured tubules first became affected, and later, the ascending loops to a slight degree. But the epithelium is entirely necrotic, and cylinders are formed, whilst with cantharides there is a breaking up and degeneration of the epithelium, and a peripheric nuclei-containing border remains. In chromic-acid poisoning, therefore, it is clear that the hurtful substance is eliminated by the epithelium, and destroys it while passing through. In cantharides poisoning, on the other hand, the drug acts upon the epithelium whilst in the lumen of the tubules.—*Virchow's Archiv*, Bd. xciv. Hft 2.

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### *The Physiological Properties of Maltose.*

Until within the last few years the study of the digestion of starchy matters was carried on as though salival and pancreatic diastase, in acting on these substances, produced, besides dextrine, a sugar identical with glucose. Dubrunfaut, in 1847, had already announced that the sugar resulting from the action of malt on starch differed essentially from glucose by its optic properties. It was then proposed to call this sugar *maltose*. This assertion was only accepted when O'Sullivan, and after him Schulze, and then Musculus and Grüber, has shown that it was correct.

It is now well established that this sugar belongs, not to the class of glucoses, but to that of the saccharoses. This sugar is produced, as was shown by Musculus and de Mering, when saliva or pancreatic juice was used in place of malt. The study of digestion of starch matters is, therefore, not completed, when it is known that it consists in the transformation of these materials into dextrine and sugar. It still remains to be determined if dextrine and maltose, once formed, pass immediately into the blood, and are there directly utilized, or whether they must be broken up and transformed into glucose. M. BOURQUELOT now asks if there exists in the digestive juices a ferment capable of causing such a breaking up of

maltose; a point already partly examined by de Mering, Brown, and Héron. He finds that saliva, neutralized gastric juice, intestinal juice, invertine, and saliva and invertine combined, have no action on maltose, not more, except the last two, than on saccharose. When the intestinal juice has not been filtered through the apparatus it breaks up the two sugars.

M. Bourquelot concludes: 1. The small intestine is not the exclusive seat of saccharose digestion, and the precipitated acids may be considered as the important factors of the conversion. 2. Maltose, on the contrary, cannot be broken up in the intestine. 3. If the intestinal reduction of the two sugars is due to fermentation, it is different from invertine, which does not act on maltose.—*Revue Scientifique*, Nov. 10, 1883.

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*Artificial Inflation of the Large Intestine as a Diagnostic and Therapeutic Measure.*

The whole large intestine can be fully dilated by injections of solutions of bicarbonate of soda and an acid, thus causing the development of carbonic acid gas. The procedure, as recommended by Professor von Ziemssen, is as follows: A rectal tube, about six inches long, is carried into the anus, and fixed by pressing together the nates, the patient lying on the back. A funnel is then connected with the rectal tube by means of rubber tubing. For complete inflation of the large intestine, ʒv of bicarbonate of soda, and ʒivss of tartaric acid are separately dissolved in water, and portions of either solutions alternately added. This is preferable to introducing the whole of the solutions at once, as the sudden distension of the intestine by the large volume of gas will cause a good deal of pain. Hence it is better to have intervals of several minutes between the additions of the solutions. Lest the gas should be developed in the rectal tube, the soda solution should be washed into the intestine by a little pure water.

Professor von Ziemssen claims that this method is very valuable as a diagnostic means, enabling the operator to judge definitely as to the position, form, and dilatability of the large intestine, the degree of occlusion of the ileo-cæcal valve for gases, the communication of the colon or rectum with neighbouring organs, as the stomach, small intestine, or bladder, or with the external surface of the body; also as to narrowing or occlusion of the intestinal canal, and under certain circumstances, also, as to the nature of an obstruction to the passage of feces. A very important use of this method is to diagnosticate the position of contractions, stricture, or occlusion of the intestine in cases in which it is desirable to operate, and also as showing the positions of peritoneal adhesions. Several cases are recorded in which a correct diagnosis was arrived at by this method, some being verified by post-mortem examination. As a rule, the small intestine is completely closed to the entrance of substances from the colon by the ileo-cæcal valve; under the influence of deep chloroform narcosis, however, this resistance is lessened, and fluids can be thrown into the small intestine.

As regards the therapeutic application of intestinal inflation, it may be used to cause evacuation of the bowels; carbonic acid gas being a prompt promoter of intestinal peristalsis. When used for this purpose, about one-half the above quantity of the reagents is sufficient. In cases of suspected ileus or intestinal obstruction, the bowel can be inflated whilst the patient is anæsthetized.

*Contraindications.* — Theoretically, artificial inflation is contraindicated in affections in which there is diminished resisting power of the intestinal walls, but practically this contraindication exists only in typhoid fever and intestinal tuberculosis.

In other cases of ulceration and carcinomatous disease of the intestines, von Ziemssen has met with no bad results from its use. It is also, theoretically,

contraindicated after diffuse or circumscribed peritonitis, and especially after perimetritis and perityphlitis, on account of the danger of tearing adhesions and thickenings of the serous membrane, but practically this is not to be dreaded. The rupture of adhesions by gas inflation often causes tolerably intense pain, but does not cause inflammation; and on that account repeated inflation is useful in removing the after-effects of perityphlitis and periproctitis.—*Deutsch. Archiv für klin. Med.*, Bd. xxxiii., Hft iii. and iv.

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*Solubility of Uric Acid in Saline Solutions.*

M. JAHNS, of Göttingen, in an article on this subject, regards it of importance that the physician should know the influence exerted by the different salts, and particularly by the alkaline carbonates on the solubility of uric acid. The determination of this solubility has engaged the attention of chemists for some time. Liebig recommended phosphate of sodium to dissolve uric acid, and Wetzler has used borax for the same purpose. Lipowitz first noticed the powerful solvent action of carbonate of lithium on uric acid, and showed that it was superior to the carbonates of potash or soda, the acetate of potash, borax, or sodium phosphate.

Binswander has determined the solubility of uric acid at blood temperature. His experiments were made with grs. iv of the salt in f℥j of water; for the carbonate of soda f℥ij of water were used. His results were as follows:—

| | | | | | | |
|---|---|---|---|---|---|---|
| Grs. iv of | borax . . . | dissolved grs. | iijss | of | uric acid. |
| " " | sodium phosphate | " | j½ | " | " |
| " " | carbonate of lithium | " | xv | " | " |
| " " | sodium carbonate | " | ij¾ | " | " |
| " " | sodium bicarbonate | " | ij | " | " |
| " " | borate of potash | " | ijss | " | " |
| " " | borate of ammonium | " | ¾ | " | " |
| " " | boric acid . . . | " | ½ | " | " |
| f℥j of | water . . . . . | " | $\frac{1}{100}$ | " | " |

Becker has recommended birocitrate of magnesium, and a mixture of borax and sal ammoniac as solvents of uric acid. Madsen has given a formula for the preparation of birocitrate of sodium and magnesium, and states that it exercises a superior solvent action on uric acid to benzoate of lithium. In the following experiments a definite weight of pure uric acid, dried at 100° C., was frequently shaken for eight hours in a saline solution at a temperature of 38° to 40° C., the undissolved acid was then collected on a filter, washed with a definite quantity of water, dried at 100° C., and then weighed. The salt was dissolved in 200 c. c. in quantities of grms. .4 to .45, avoiding the deposit of acid urates. Under these conditions, the mean of five experiments showed that grm. 0.0214 of uric acid was dissolved in 200 c. c. of water. After deducting this weight from the quantity dissolved by 200 c. c. of the saline solutions, the results were as follows:—

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 part of | carbonate of lithium . . | dissolves | 3.51 | parts | of uric acid. |
| 1 " | benzoate " . . | " | 0.026 | " | " |
| 1 " | chloride " . . | " | 0. | " | " |
| 1 " | carbonate of sodium ($+10\,H_2O$) | " | 0.98 | " | " |
| 1 " | phosphate " ($+12\,H_2O$) | " | 1.25 | " | " |
| 1 " | borax . . . . ($+10\,H_2O$) | " | 0.83 | " | " |
| 1 " | sulphate of sodium ($+10\,H_2O$) | " | 0. | " | " |
| 1 " | chloride " . . . . | " | 0. | " | " |
| 1 " | borocitrate of magnesium . . | " | 0.099 | " | " |
| 1 " | " " (Madsen) | " | 0 093 | " | " |

To obtain the total solubility, it is necessary to add to these numbers grm. 0.0214 of uric acid.

Jahns, in experimenting at 38° to 40° C. with fourteen specimens of continental mineral waters, found that Vichy (Grande Grille) gave the highest percentage, 200 parts dissolving .765 part of uric acid. From his experiments it is evident that the chlorides and sulphates have no influence in dissolving uric acid, and that the alkaline and earthy carbonates only increase the solubility of uric acid in considerable proportions. In diluted waters the solubility of uric acid remains proportional to the quantity of the alkaline and earthy carbonates; hence mineral waters poor in carbonates have little effect.

The calculation shows, moreover, that for the formation of an acid urate the following quantities of uric acid are needed:—

| | | | | | |
|---|---|---|---|---|---|
| 1 part of carbonate of | lithium | = 4.54 | parts of | uric acid. |
| 1 " " | magnesium | = 4. | " | " |
| 1 " " | lime | = 3.39 | " | " |
| 1 " " | sodium | = 3.1 | " | " |
| 1 " " | potassium | = 2.43 | " | " |

The greater the molecular weight of the carbonate, the greater its solvent action on uric acid.—*Ann. des Mal. des Organes Genito-urinaires*, Nov. 1883.

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## MEDICINE.

### *A Typical Case of Myxœdema.*

At the meeting of the Clinical Society of London, on November 23d, Dr. Drewitt exhibited a case and described it. The patient was a woman, aged 45, who had been an out-patient at the West London Hospital during the last year. The disease was of twelve years' standing, dating from a time when the poor woman lost her husband and one of her children. At that time, she was slightly built and active; but since then she had gradually become stout and heavy, slow and languid and feeble in moving, slow and deliberate and indistinct in her speech. She was afraid of going about alone, lest she should be run over; and she could hardly lift her feet high enough to get upstairs. She was always cold, even in summer, and never perspired. Her bowels were obstinately confined. There was dyspepsia, and she had partly lost the senses of taste and hearing. All the characteristics of the disease were present—the generally swollen look; the round and fat face; the sallow, translucent, wax-like skin; broad nose; thick, coarse, purple lips. On the cheeks was the same peculiar dusky reddish purple colour, caused by dilated capillaries and veins. The eyelids were pendulous and transparent; the tongue, which was pale, swollen, smooth, and tooth-marked, was too large for the mouth, and more "cretinoid" than the intellect; the soft palate was also swollen and pale. The abdomen was greatly enlarged, as if from growth of fat; the swelling, in fact, was universal, but there was nowhere pitting on pressure. The skin of the hands and arms was rough and scaly, as in xeroderma. The hands were thick and swollen, and could no longer be clasped. The wedding-ring became imbedded in the swollen finger, and had been cut out by a jeweller. Pulse 76, feeble. The heart-sounds were distant, feeble; there was no murmur. Temperature in axilla only 95°. Urine, specific gravity 1011; it contained no albumen nor sugar. Dr. Drewitt remarked that the spade-like clumsy hand had been especially noticed by Sir William Gull in his paper read before this Society, describing the disease for the first time, just ten years ago; but he thought that the most striking physical peculiarities were

the pendulous eyelids, like alabaster in translucency, and the purple pouting lips. Tranquillity was also, in those few cases he had seen, a most marked characteristic. Though painfully conscious of their state, these patients were not irritable. As to the pathology, Dr. Ord had described the *post-mortem* appearance. The whole connective tissue of the body had been found swollen and jelly-like, and œdematous, with mucin. The swelling seemed sufficient to account for all the symptoms. The heart and arteries were obstructed by it, and hence the feeble blood-current, the deficient aëration of the blood, and the purple of the cheeks and lips. The tongue and palate were swollen with it, the intestine choked by it, the senses dulled, the functions of organs interfered with, and the patients died with all their tissues smothered by their own padding. In treatment of this patient he had found strychnia of the most value, and both muscular movement and speech had increased in briskness under it. In the appearance of the patient, however, there had been no improvement. As to the origin of the disease, it had been, perhaps, rightly ascribed to nerve-influence. Great anxiety or mental shock had occurred at the beginning of many cases. In Dr. Ord's first case, as in the one now before the Society, it followed upon the fatal illness of a husband. In Dr. Cavafy's first case it followed a shock; in his second, a bad time at childbirth. Dr. Duckworth's second patient mentioned that it came on after her husband had kicked and ill-treated her. Dr. Semon's patient had fourteen children and some miscarriages in a "comparatively short time." Great mental anxiety or distress profoundly depressed man's vitality. The secretions of gastric juice, saliva, bile were all influenced by emotion; mental shock was given as a cause of atrophy of the liver, and syncope might follow bad news; therefore, it would not be wonderful if it should be shown that the nutrition of the connective tissue of the body were altered in this way. Sir William Gull in his paper had alluded to the changes in the thyroid in true cretins. It would be interesting to know whether instances, either of atrophy or hypertrophy of the thyroid, had been observed in any of these cretinoid cases.

Dr. FELIX SEMON called attention to a most important contribution towards the etiology of myxœdema. At the twelfth Congress of German Surgeons, held at Berlin, in April of this year, Professor Kocher, of Berne, read a paper on "Extirpation of Goître and its Consequences." His personal experience was based upon no fewer than 101 total, or partial, extirpations of goitre, and was secondary to no living surgeon's, except that of Professor Billroth. His attention was drawn to the after-state by the report of the general medical adviser of one of his patients. Professor Kocher, having seen the patient in question himself, was so much surprised, that he immediately requested all his patients, upon whom he had performed that operation—except those only very recently operated upon—to present themselves for the purpose of a re-examination. By many circumstances (death, loss from view, cancerous nature of the goitre, inability of attending personally, etc.) the number of those attending was reduced to thirty-four. In sixteen of these cases a partial extirpation only had been made; *i. e.*, one lobe, with or without the isthmus, had been removed. In all the cases belonging to this category, the result of the operation had been an excellent one; the dyspnœa, for which the partial extirpation had been performed, had disappeared, and the general health had suffered in no respect. Matters, however, were different with regard to the eighteen patients on whom total extirpation of the thyroid body had been performed. Of these, two only showed an undeteriorated, or even improved, state of health; but it was remarkable that, in one of these two cases, a small accessory thyroid gland had undergone a hypertrophic change, and that, in the other, a recurrence of the goitre had taken place. All the remaining sixteen patients showed more or less considerable derangements

of their general health, which derangements, though all of the same kind, were different in degree, the changes being much more developed in the oldest cases than in those more recently operated upon. These changes were, therefore, of a distinctly progressive character. As to the nature of the changes themselves, they were, in the order as related by Professor Kocher, the following. A few months after the operation, early fatigue, weakness, and sensation of heaviness in the limbs were complained of. In many cases, these were preceded by actual pains in different parts of the body. Soon afterwards, a sensation of coldness, especially in the extremities, was superadded. In winter time, the hands and legs swelled, became bluish-red and cold, and the patients suffered from chilblains. The mental activity decreased. Thought, speech, and movements became slower. At the same time, the patients were themselves painfully aware of these facts. About simultaneously with the above-enumerated symptoms, swellings of the face and body made their appearance. They were sometimes at first only transitory, but generally soon became lasting features. The parts most and earliest affected were as a rule the infra-ocular region and the eyelids, which showed a somewhat transparent swelling; later on, the nose became thick, the lips coarse, the hands and feet swollen, the waist stouter. The skin became dry, desquamated a little, was infiltrated, its elasticity lost; it could only be lifted in thick folds. The hair fell out. A most marked symptom in the more advanced cases was anæmia. Examination of the blood showed a relative richness of leucocytes, inasmuch as the number of the red blood-corpuscles was greatly diminished. In those cases in which the patients at the time of the operation were still growing, their development became most markedly arrested after the operation. Rarer symptoms were: slight dysphagia, giddiness, headache. Ophthalmoscopic examination, made in a number of cases by Professor Pflüger, did not reveal anything abnormal, beyond remarkable narrowness of the arteries. Professor Kocher concluded his description by the remark, that the relationship of the above combination of symptoms to those of idiotism and cretinism was unmistakable. Being himself unaware of the existence of myxœdema, he proposed for the affection he described the name of *cachexia strumipriva* (struma-goître). Similar observations had been made by Professor Reverdin, of Geneva. Having given this report, Dr. Semon said that, in a case of his own, in which Professor Lister had kindly removed the thyroid body *in toto* three years ago, great pallor and occasional swellings under the eyelids had since made their appearance, as he had ascertained by making inquiries. The patient also suffered frequently from general malaise. He was, however, far from attributing too great a value to written reports, and communicated this for the sake of completeness only. Returning to Professor Kocher's paper, he regretted that time did not permit him to enter upon the highly interesting and ingenious hypothesis, by which this author tried to explain the nature of the changes described by him. He (Dr. Semon) thought, however, that the identity of these changes with those met with in myxœdema, which he had found when reading through Professor Kocher's paper, was very evident. Not one symptom was present in myxœdema which was not met with in these cases of total extirpation; on the other hand, one symptom only had been observed in a certain number of these cases which was not present in myxœdema, viz., the arrest of the growth of the body after total removal of the gland in children. But the explanation of this difference was obvious: myxœdema was essentially a disease of adult life. Looking upon the whole question from a broad point of view, there appeared to be three conditions closely allied to each other, and having in common either absence or probably complete degeneration of the thyroid body: namely, cretinism, myxœdema, and the state after total removal of the thyroid body. In all three states, certain

conditions of arrested development of mind and body were met with, which, looked upon in the new light thrown upon the subject by Professor Kocher's observations, could hardly be attributed to anything else but to the loss of the thyroid body, common to them all. Speculations as to how these changes were brought about, and what was the exact influence of the thyroid body upon the composition of the blood and other tissues, seemed at present to be premature; but it was perhaps not too bold an hypothesis to assume that, if the absence of the thyroid gland would lead to arrested development of mind and body, it might also lead to arrested development of higher forms of organized tissue, and that under such conditions the lowest type or organized tissue, the fœtal tissue, mucin, could mainly be formed, and was formed, in excessive quantities. Thus the excess of mucin in the tissues, which had been supposed to be the essential feature of myxœdema, might possibly find its explanation.

Dr. ORD remarked that, when Kocher's paper was published, his (Dr. Ord's) friend Dr. Semon at once drew his attention to it. By his advice, the speaker wrote to Professor Kocher, comparing his cases with myxœdema, and sending him some photographs. He wrote in return a letter, from which Dr. Ord now ventured to read an extract, indicating the way in which the coincidence had been regarded by him. "There cannot be the slightest doubt of the analogy of myxœdema and cachexia strumipriva. I was not aware of it before, having never seen a case of the affection. I think you will agree with me that, by my observations, the atrophy of the thyroid body, which you have found in your cases, gets much greater importance. According to what I have seen, the extirpation of the thyroid gland is the direct and sufficient cause of the whole affection. I thought that it was especially in young people that the symptoms were severe, and so it is certainly; but I have seen two cases in adults since the publication of my paper, and I grow more and more convinced that the excision of the whole organ, when nothing of it is left behind, has, as a necessary consequence, the cachexia. If that is the case, it seems not very probable that the lesions of fibres of the sympathetic nerve occasion an accidental neuritis of the same, because we do not see anything like that in excision of other organs. It would be necessary to state a peculiar relation of the thyroid body to the sympathetic nerve, to explain the constant affection of the latter. I hope to be able to have a necropsy, sooner or later, of one of my cases; and then it will be possible to compare it with the result of your most interesting *post-mortem* examination. If I am not mistaken, you do not speak of affection of the pupils or unilateral congestion of the face, or alteration of the function of the heart. I admit that the combination of affection of the thyroid gland, with irritation of the sympathetic nerve, in Basedow's disease, much induces one to think of an analogy in the opposite way. At any rate, the functions of the cerebrum seem to be impaired very soon. People lose memory, do not hear and see as well as before, cannot speak as they did before, complain of pain and excessive fatigue in all members." These observations certainly pointed strongly to the probability that atrophy of the thyroid body was, in some way or other, the cause of the condition, myxœdema. The very title of Sir William Gull's original paper; the cases of Mr. Curling; the paper of his lamented friend, Dr. Fagge, on Sporadic Cretinism; the very complete atrophy of the thyroid found at the *post-mortem* examination of his first case, all tended in the same direction. So, also, did Dr. Fagge's suggestion as to the sort of inverse ratio between goitre and cretinism, to which the report of the Sardinian Commission lent some support. But before he (Dr. Ord) could allow himself to express a decided opinion, there was still much to be observed and thought out. He handed round a photograph sent by Dr. Kocher, showing the after-condition in one of his cases. It showed, with characters of myxœdema,

marks of a cretinoid arrest of development, which did not, of course, exist in the cases where the disease had begun in adult life.

Dr. CAVAFY thought the natural history of the disease deserved much attention; so far as he had seen, the course was not one of uniform deterioration, but there were distinct periods of quiescence, or even improvement. The younger of the two cases he communicated to the Society two years ago was a good illustration of this; after leaving the hospital, she became pregnant, and, during gestation, suffered much from swollen legs and other discomfort; labour was protracted and difficult, owing chiefly to great œdema of the genitals, but the child was quite healthy. Soon afterwards, she came to the hospital to say she was much better, and all who saw her were struck with the marked improvement in her condition; the swelling of the face and hands was greatly diminished, her expression brighter, and speech nearly normal; but she gradually relapsed into her previous condition. He thought the improvement might be accounted for by the stimulus to general nutrition caused by the puerperal state. In another case, of a gentleman with marked myxœdema, whom he had seen once, he had been told that ascites supervened, and necessitated tapping on several occasions; ultimately the fluid ceased to reaccumulate, and it was then found that the characteristic signs of myxœdema had nearly disappeared, and he was better than he had been for many years. In this case, it seemed as if a deviation had taken place—the general œdema, which was probably to a great extent serous, having, so to speak, drained into the peritoneal cavity. These were the most striking instances which had come under his notice; but in every case he had seen, there had been longer or shorter intervals of more or less marked improvement, which he was unable to associate with treatment, or with any alteration in the general surroundings of the patient.

Dr. R. CROCKER said, in reference to the elimination of urea which had been observed to fluctuate in myxœdema, that too much stress must not be laid upon this. Some years ago, in making some experiments upon the influence of alcohol upon the excretions of a dog, he made a long series of preliminary determinations of urea, in order to ascertain the normal elimination of the animal, which was kept in exactly the same conditions as regards diet, etc. He found very wide fluctuations in the amount of daily elimination, and that without any apparent cause. In several cases of universal dermatitis, where the urea had been estimated, there had also been considerable fluctuations; it was obvious, therefore, that it would be necessary to carry on the observations for long periods before any reliable results would be obtained.

Dr. ORD said, in answer to Dr. Cavafy's question, that the first patient in whom he had studied myxœdema—as far back now as twenty years—bore two children after the condition was well established; and that there was no change in the symptoms during or after either pregnancy. No doubt, there were to be noticed in most cases such periods of seeming amelioration as Dr. Cavafy had mentioned; but, until within the last three years, he had witnessed in all cases a distinct tendency to progress from bad to worse. He was led by the desire to give one of his patients relief by diaphoresis to try the use of jaborandi. The effect of the drug after several weeks' use was so beneficial, that he had since used it in all cases. He might report that in all the cases it had given relief; that in some its use had been followed by a change for the better far exceeding what was observed in the ordinary changes of the disease; and that, in one or two cases, something like a cure had been effected. One patient certainly had lost all her œdema, had recovered her activity of body and of mind, and declared herself to be quite well. This was more than he (Dr. Ord) dared to say till after some longer lapse of time. The jaborandi was given in the form of a tincture;

thirty drops in a teacupful of hot water, with a little sugar, three times a day; the dose was gradually increased to sixty, ninety, or even one hundred drops three times a day; and the drug was given for months together.

Dr. WHIPMAN had heard with satisfaction the results of Dr. Ord's treatment of myxœdematous patients with jaborandi. It had occurred to him some time since that diaphoresis might relieve many of the symptoms. He began by trying hot air-baths in a woman recently under his care, but at first no sweating took place; on repeating the bath once or twice, fair diaphoresis was produced. Pilocarpin, subcutaneously injected, was then tried with the same patient, in doses of one-twelfth of a grain. It was found, however, necessary to increase the amount to one-fourth of a grain in order to produce the desired effect. The patient suffered more or less from headache on the day following the injection, but expressed herself as feeling greatly relieved, and "much lighter" in consequence of it. She was eventually sent to the Morley Hospital, much improved. A few days ago, however, she again presented herself for advice, all the good effects of the former treatment having passed off. Hot air-baths having produced but little sweating, the tincture of jaborandi was tried in drachm doses, but caused severe headache and sickness. The dose was probably too large.—*British Med. Journal*, December 1, 1883.

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*Etiology of Tabes Dorsalis.*

In 1881, Professor Erb published his first series of 100 cases of tabes dorsalis, showing the frequency of previous syphilis in this disease. In 88 of these cases there had been previous syphilis, in 12 there had been none. Since that date, Fournier, in his work on Locomotor Ataxia of Syphilitic Origin (1882), gives the percentage of cases in which there has been previous syphilis as 93; Vogt, a former opponent of syphilitic tabes, in his latest statistics, gives the percentage as 81.4. The *Berliner klinische Wochenschrift*, No. 32 of this year, contains a paper by Erb giving a second series of 100 cases of tabes dorsalis. Out of this series, 9 only of the cases had had no syphilis, while 91 had had previous syphilis. Of these 91 cases, 62 had undoubted secondary syphilis, 29 had primary sores, but no secondary symptoms were noticed. Of these 29 cases, 5 had true hard sores, 10 were treated with mercury and iodide of potassium, and in 14 the treatment and the nature of the sore are not noted. The tabes dorsalis manifested itself at the following periods after infection with syphilis: 13 cases occurred between the first and fifth years, 31 between the sixth and tenth, 25 between the eleventh and fifteenth, 15 between the sixteenth and twentieth, 5 between the twenty-first and twenty-fifth, 1 between the twenty-sixth and thirtieth, and in 1 case the period was unknown. Thus 69 of the 91 cases occurred during the first fifteen years after infection, 15 in the period between fifteen and twenty years, and 6 still later. As a check observation Professor Erb ascertained that of 1500 patients who attended his clinic, who were not tabetic, 77.25 per cent. had never had syphilis, and that 22.75 per cent. had been infected. Of these latter 10.25 had suffered from secondary symptoms, and 12.50 from chancres only. From these observations he concludes that syphilis is such an important factor in the etiology of tabes dorsalis, that scarcely any one who has not had syphilis or a chancre has a chance of becoming tabetic. As to the other factors in the etiology of tabes (viz., heredity, catching cold, fatigue, sexual excesses, and injury), he considers them of much less importance; of the 100 cases of the present series he gives in 36 cases syphilis as the only assignable cause, in 17 cases syphilis and cold, in 8 syphilis and fatigue, in 7 syphilis and excesses, in 2 syphilis and injury, in 15 syphilis, cold, and fatigue, in 4 syphilis, cold, and excesses, in 3 syphilis, fatigue, and excesses, in 1 syphilis, excesses, and injury as the assignable causes,

and in 3 cases cold alone, in 2 cases fatigue alone, in 1 case excesses alone, and in 1 injury alone. Syphilis is thus the most frequent and important change of condition that favours the development of tabes, the other factors generally acting in company with syphilis.

The frequent paralysis of ocular muscles, the affection of the pupils, the presence of symptoms pointing to syphilitic affections of the cerebral nervous system (viz., hemiplegia, apoplexy, epileptiform attacks, and frequent headache); the presence of syphilitic affections of the skin, the mucous membranes, and the bones; the fact that in cases of tabes occurring late in life the patients have usually acquired syphilis late in life (in one case the patient acquired syphilis at the age of forty-eight, and became tabetic at the unusually late age of fifty-eight; in another case the patient, who had acquired syphilis at the age of thirty-eight, became tabetic at fifty); the relative frequency of syphilis and tabes in men and women (being in each disease as ten to one), the relative frequency of tabes and syphilis in women of the lower classes, the relative rarity of both in women of the higher classes;—these facts Erb considers of great importance in assigning syphilis as the most important factor in the etiology of tabes. The occurrence of previous syphilis in tabetic women he considers not at all infrequent, for, of 13 cases of tabes in women, 6 had a clear history of syphilis, 4 had no history, and in three cases the history was doubtful. From these statistics Professor Erb holds that syphilis is one of the most important, if not the most important, cause of the occurrence of tabes. That tabes is a specific disease, a late manifestation of syphilis, he does not consider to be proved, though he thinks it extremely probable.—*Med. Times and Gaz.*, Sept. 1, 1883.

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*Hemiatrophy of the Tongue in Tabes Dorsalis.*

Among the various affections observed in the course of tabes dorsalis, and sometimes beginning early in the disease, is hemiatrophy of the tongue, a symptom to which but little attention has been paid. This hemiatrophy is, however, says M. Gilbert Ballet, quite frequent, and on account of its rarity in other cerebro-bulbar affections than locomotor ataxia, it has a high diagnostic value, and may materially aid in clearing up a doubtful case. This symptom has several times been observed by Professor Charcot in tabetic cases.

Hemiatrophy of the tongue is manifested by a very marked diminution of one side of the tongue; sometimes the right, at other times the left side being affected. The affected side presents numerous wrinkles and furrows, which give the affected side a sort of vermicular appearance Sometimes there is noticed a slight trembling with fibrillar contraction. The tip, in a case under observation, points slightly towards the affected side. This lingual atrophy interferes but very little with speech, and, in the ataxics which Ballet has had under observation, it does not seem to interfere with deglutition or mastication.

In most of the cases observed, hemiatrophy of the tongue was associated either with ocular paralysis or with atrophy of certain muscles of the limbs. This last coexistence sufficiently establishes the fact that the pathology of lingual amyotrophic paralysis is the same as that of the muscles of the thenar eminence or of the forearm. What gives a particular interest to this symptom is the fact that it may appear after the first phase of ataxia, and constitutes the only ostensible and clear manifestation of the affection, at a time when other symptoms are only slight or have not even made their appearance; hence in these cases it becomes a highly important diagnostic symptom, so much so that tabes dorsalis may be safely diagnosticated when it is present.—*Le Progrès Méd.*, October 27, 1883.

*Sclérose en Plaque in Infants.*

Dr. PIERRE MARIE has a late article on this subject, in which several cases are reported.

*Etiology.*—As to age, the disease seems to affect children between fourteen months and fourteen years. It most commonly affects those about the age of three or four years. As to the sex, there seems to be a slight predominance in the male sex, eight boys to six girls. This result does not accord with the opinion of Charcot. The difference, however, is very slight.

The causes of the affection are not so easily discovered in youth as in adult life. As a rule, there is some anterior affection; in a case reported by Schüle, the child had had jaundice with albuminuria; in one reported by Pollard, the affection began during convalescence from scarlatina. These are not exceptional cases, but are analogous to the etiological onset of the disease as seen in adults, as in a case reported by Charcot and Joffroy the affection came on after an attack of cholera, with a subsequent attack of typhoid fever. During convalescence the patient complained of feebleness in the legs, the first indication of medullary sclerosis; this steadily progressed. In another case, reported by Charcot and Bourneville, the disease commenced during convalescence from smallpox; a similar case has been reported by Otto; one by Westphal following typhus fever; and several others following variola; and one reported by Ebstein coming on during an attack of typhoid fever. It would seem, therefore, that this is more than a simple coincidence, and, without pretending to relegate all scleroses of the nervous system to this pathogenesis, it must be regarded as an important element. In all the cases cited by Marie there is one especially striking fact, viz., all the previous diseases were of the infectious type. Does the infecting agent act directly by its presence, by localization in certain parts of the central nervous system, or by pathological products produced by itself, or by the animal economy under its influence? These products, passing through the lymphatics of the nervous system, irritate them; this irritation produces an interstitial proliferation, thus causing sclerosis of different parts of the central nervous system. The frequency of arterial lesions in infectious diseases is well known, particularly more or less generalized arteritis; and the relations between sclerotic patches with the distribution of the arteries has been clearly shown by Ribbert and Klein. There seems also to be a hereditary factor in the production of the affection. Wilson reports a case in an hysterical person; Dreschfeld reports two cases occurring in two brothers, and Cheadle reports a case in which the brother had chorea. The rheumatic and gouty diatheses seem also to play a part in causing the affection.

*Symptoms.*—The symptoms of the disease, as observed in children, are identical with those seen when it affects adults. Frequently it begins by difficulty in walking, paresis of one or more limbs, trembling, which is only noticed when voluntary movements are attempted, characteristic ocular troubles, as nystagmus and strabismus, either transitory or permanent, and articulation is embarrassed, being slow and monotonous, as in adults. In some cases there are convulsions or apoplectiform and epileptiform attacks. The trembling, noticed during voluntary movements, commences sometimes in one arm, sometimes in both. It may be so great that the child cannot carry food to its mouth. It often affects the muscles of the neck and trunk, so that, when locomotion is attempted, the head and upper part of the body are immediately seized with more or less violent oscillating movements. More often, however, the trembling commences in the lower limbs, so that walking is very difficult or impossible. Ten Cate Hœdemaker described it as having the characteristics of spasmodic paraplegia. In one of

Bristowe's cases there was exaggeration of the patellar reflex. Another symptom sometimes seen, and which shows an approaching fatal termination, is glosso-labio-pharyngeal paralysis. The cerebral symptoms noticed in this disease are both frequent and important. These symptoms, of one kind or another, were seen in twelve out of fourteen cases. It is true that the psychical troubles may be extremely slight, and consist simply in some eccentricity or irritability; but while they exist in various degrees, their frequence is none the less remarkable. Sometimes the patients will laugh immoderately at a most trivial circumstance, and then suddenly burst into tears. Their intelligence may be blunted or very much weakened; memory becomes impaired, often the child cannot be taught to write; and, as in a case reported by Schüle, the mental powers gradually become weaker, and the patient passes into a state of complete imbecility.

As to the epileptiform and apoplectiform attacks already spoken of; an apoplectiform attack has been seen in one case, and epileptiform attacks in two. In six other cases, however, infants have had convulsions either at the beginning or during the course of the affection. But it should be remembered how common are convulsions during infancy. In Bristowe's case the patient had four attacks of somnambulism after the affection commenced.

The diagnosis is to be made between this affection and hereditary ataxia, chorea, spasmodic tabes, and infantile hemiplegia. There is no especial difficulty in making these diagnoses if the symptoms of the other affections be borne in mind. As to treatment, galvanism and nitrate of silver have been tried in vain. Nothing seems to produce any amelioration of the symptoms.—*Revue de Médecine*, July, 1883.

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### *Mediastinal Tumours.*

The infrequent occurrence of sarcomatous growths involving the pericardium, and the difficulty of diagnosticating these cases have induced Dr. Paul Liborius, of Kronstadt, to report some interesting cases coming under his observation.

The first case reported is that of a sailor, æt. 34 years, who was under treatment in the Kronstadt hospital. The patient's history was as follows: In 1877, during the Turkish war, he was taken with intermittent fever. Previous to this time he had been in good health. He did not entirely recover from the malarial poisoning, and in 1881 he sustained a contusion of the forehead, which did not result seriously, however. In the early part of 1882, he was sick for six days with a pain in the left side, the left upper extremity and the head; this, however, did not prevent his performing his usual duties. In the spring of 1882, examination disclosed a cardiac murmur, but there were no subjective symptoms. A few months later, he complained of pain in the head, breast, and right shoulder. His temperature was 101.6°, there was a dry cough; percussion showed nothing abnormal, and auscultation only dry râles. On the next day the right shoulder was red and swollen, and movements gave pain; there was also slight swelling of the right ankle-joint. This swelling and pain completely disappeared in about a month, but the cough continued, and more pronounced râles appeared in the lungs with quite profuse expectoration, and some dyspnœa developed. This increased and the countenance became cyanosed, as did the hands. The intellect remained clear, the pupils reacted well and there was no headache. The chest was well-developed, and examination at this time showed nothing abnormal on percussion, vesicular breathing on auscultation, and moist râles under the left scapula. Respiration 32. The cardiac dulness reached upward to the third rib, and extended from the left mammillary to the parasternal line. The apex beat was in the fifth intercostal space. The sounds were only feebly audible, and there was a systolic murmur, most clearly heard over the aorta, though two of

the examiners claimed to hear it most distinctly at the apex. There was a feeble carotid murmur. Pulse small and irregular, and could not be counted.

The liver was slightly enlarged, and painful on pressure in the scrobiculum cordis. The appetite was small, there was constipation, and sleep was restless. The urine for twenty-four hours measured 400 c.cm., was dark-coloured, muddy and acid. Sp. gr. 1030, considerable quantity of uric acid salts, a few cylinders, and traces of albumen. Temperature 100.4°. The dyspnœa became so great that the patient was compelled to assume the sitting posture for the greater part of the time; while in bed he lay upon the left side. Administration of digitalis brought the pulse down to 100, and regulated the heart's action. No difference could be observed between the radial pulses. Œdema of the left upper extremity soon set in, from the middle of the *arm* downward. (The patient, as already stated, lay only upon the left side.) After this, œdema of the feet set in, and soon the expectoration became coloured with blood; then the right upper extremity became œdematous, the lower extremities soon becoming affected, the symptoms grew worse, and the patient died on Sept. 23d, having been taken ill on July 12th. *Autopsy.*—The chest was opened in such a manner that the heart and lungs could be removed while retaining their relative positions. It was then found that the pericardium, especially on the left side, was considerably distended and its cavity almost entirely filled with a large uneven tumour, containing coagula of dark-red dirty colour. This tumour occupied the place of the heart, which was pushed over to the right side, its left auricle and ventricle being strongly compressed. The cardiac valves, and those of the aorta and pulmonary artery, were intact. The heart substance was of tolerably soft consistence, and looked brown on section. The circumference of the tumour was as large as that of a man's head; long diameter 20, diameter 15 cm. The left upper part of the tumour perforated the pericardial sac, which was considerably thickened and firm in its whole left half, and was completely adherent to the tumour at the point of perforation. At the entrance of the left bronchus into the lung there was, in the tumour, a white nodule of the size of a walnut. On section this had the appearance of marrow, and was tolerably solid, and exuded a milk-like fluid on pressure. There were similar nodules in other parts of the tumour, but not so sharply defined. The aorta and pulmonary artery were so adherent to the tumour that they could not be separated. The lung, on section, was dry and pale. In the left upper lobe were two nodules, similar to those already mentioned. *Microscopical* examination showed the tumour to contain round cells of different size, with clear contour and glistening nuclei. An intercellular substance was recognized with difficulty. In some places only was a connective tissue stroma easily made out. There were also small round cells with small nuclei and fine granular protoplasm. The tumour was diagnosticated as sarcoma; sarcoma globo-cellular telangiectodes, or sarcoma mixtum telangiectodes.

A second case giving similar symptoms was diagnosticated post-mortem as: Medullary sarcoma of the posterior mediastinum with perforation of the left auricle by the tumour. Thrombosis of the veins emptying into the superior vena cava; double hydrothorax; œdema of the lungs and cellular tissue of the whole body. A third case is also reported of round-celled sarcoma involving the brain, lungs, and pericardium. In 7566 cadavers examined at the marine hospital at Kronstadt, there were found 158 malignant tumours, 127 being carcinomatous. These occurred in 81 men of an average age of 53 years, and 46 women of average age of 56. The other 31 cases were of sarcomatous tumours, with an average age of 41 years; 20 being men of average age of 38, and 11 women of 48 years. Sarcomata affected the heart, lungs, and pericardium in only 4 cases.—*Virchow's Archiv*, Bd. xciii. Heft 3.

*Myocarditis in Diphtheria.*

UNRUH (*Jahrbuch für Kinderheilkunde*, Band xx., Heft 1) has met with myocarditis in eight out of 237 cases of diphtheria, and also in one case of scarlatina. Of these nine, six were boys. Two of the children were 6 years old, two 11 years old, and the remaining five were aged 7, 8, 9, 10, and 12. There was nothing in the history of any of the cases to account for an affection of the heart. The diphtheria was always of a severe kind, and involved the uvula and pillars as well as the tonsils; the false membranes were fetid and of a dirty greenish colour, and left deep ulcers after their removal. The heart affection began to make its appearance as soon as the diphtheria had ceased to spread. This was from the seventh to the fourteenth day, except in one case, where it was delayed until the twentieth day. The first symptom of the heart being involved was furnished by the pulse, which suddenly became small and empty. Its frequency was at first unaltered, but, after twenty-four or thirty-six hours, was greatly increased (160–180); at the same time, the pulse became irregular. Both these qualities were greatly aggravated by changes of position. The heart's impulse was, in this stage, perceptibly and palpably weaker, and a little to the right of its normal situation. The heart's dulness extended in all the cases beyond the midsternal line, and in two (one being the fatal case) it reached a finger's breadth beyond the right sternal margin. With convalescence, it returned to nearly its normal dimensions. On auscultation, the first sound of the heart was diminished in intensity; and, when the complaint was at its height, a blowing sound, like a chlorotic murmur, was heard. In only one case was there any præcordial pain. No information was derived from the thermometer. No purpura or other hemorrhage was observed in any case; and, somewhat remarkably, dyspnœa was absent in all. The patients were drowsy and apathetic, indeed too much so to ask for nourishment. Albuminuria was present in all. The albumen first appeared when the diphtheria was at its height; then it subsided, but reappeared in greatly increased quantity soon after the heart-affection showed itself. At the same time the urine diminished in quantity, and œdema, with in one case ascites, set in. The first symptom of amendment was the lessening of the albumen.

Of the nine children only one, a boy aged 11, died. The heart in this case, examined *post mortem*, exhibited a number of rather dark-coloured deposits of various sizes, some imbedded in normal muscular tissue, others in tissue which showed fatty infiltration or degeneration. The fasciculi were separated by spaces occupied by numerous cells. The striping was faint or imperceptible. All of these changes were more marked on the right side. There was no extensive fatty degeneration of the heart.

The first few cases were treated with digitalis or ergot, but neither drug had much effect. Camphor was then tried, and with marked benefit. It was given in combination with perchloride of iron. Stimulants were freely administered. The author anticipates the objection that the cases which recovered might have been simple neuroses of the heart, and founds his strongest argument against it upon the widening of the præcordial dulness. But this was marked in two cases only.

[The author would have done better to have given separate notes of the fatal case. But the weakest part of the paper is that which relates to the necropsy. We are not informed upon the following points: 1. Was the heart dilated or enlarged? 2. Of what nature were the "numerous cells?" 3. Did these cells represent the structure of the dark deposits? 4. Were the spots found in any other organ? In the absence of information upon these points, the diagnosis of even the fatal case cannot be unhesitatingly concurred in. *Rep.*]—*London Med. Record*, November 15, 1883.

### *The Prognosis of Mitral Stenosis, Pure or Complicated, up to Fifty Years and over.*

Dr. DUROZIEZ, in an article on this subject, divides his cases of diseases or lesions of the heart into two classes, those in patients up to fifty years of age, and those of fifty years and over; of the latter class, he gives 193 cases. Of these 193 cases there are 35 of pure or complicated mitral stenosis. It may be interesting to know if many who suffer from mitral stenosis pass the age of fifty years, and what effect other cardiac lesions have on cases of mitral stenosis. Can we give these patients the hope of a relative longevity? This matter has received but little attention from authors. Autopsies of persons suffering from mitral stenosis, who have attained the age of fifty years, are very rare; and the observations of non-fatal cases are not more common, although we can to-day diagnosticate mitral stenosis with about the same certainty as we can pneumonia.

Persons suffering from mitral stenosis live longer than is generally supposed. In the text-books the degree of asystolism is regarded almost to the exclusion of the personal appearances. Without doubt there are sufferings of greater or less intensity, but the patient lives. We say that the period preceding asystolism is long or very long, but this is indefinite. We say that the subject of mitral stenosis lived long, because the lesion commenced late. It is far from easy to fix upon the exact date of the commencement of a cardiac lesion; it is not sufficient to date from a certain attack of acute rheumatism, as Duroziez has had cases of mitral stenosis under observation for more than fifteen years which are still in good general health.

Classifying his 35 cases by their complications and aggregate ages we find that: 10 cases of mitral stenosis with mitral insufficiency aggregate 554 years; 9 cases of uncomplicated mitral stenosis give 487 years; 4 cases of mitral stenosis with aortic insufficiency give 232 years; 4 cases of mitral stenosis with mitral and aortic insufficiency and aortic stenosis give 225 years; 4 cases of mitral stenosis and insufficiency with aortic stenosis and insufficiency give 213 years; 1 case of mitral stenosis with aortic insufficiency and tricuspid stenosis and insufficiency gives 58 years; 1 case of mitral stenosis with mitral and tricuspid insufficiency gives 57 years; 1 case of mitral stenosis with tricuspid stenosis and mitral, aortic and tricuspid insufficiency gives 55 years; 1 case of mitral stenosis with aortic stenosis and insufficiency gives 52 years.

It is seen that mitral stenosis with mitral insufficiency heads the list with 554 years for 10 cases, with pure mitral stenosis next, 487 years for 9 cases. We find, however, that a tricuspid lesion is a very important factor in determining a fatal issue, only three living cases being given. We are also struck by the weight which aortic lesions seem to have. Lesions of the mitral valve permit the attainment of 60 years of age; those of the aortic orifice at most 50 years; those of the tricuspid scarcely 40 years. Of the 35 cases, 18 are males, and 17 females. Duroziez draws the following conclusions: 1. Mitral stenosis (so large as to permit the passage of a finger and giving rise to characteristic bruits), pure or complicated, by other valvular lesions, exceptionally permits one to pass the age of 60 years. 2. A complicating mitral insufficiency does not aggravate the prognosis. 3. A complicating stenosis does aggravate it. 4. A complicating tricuspid lesion makes the prognosis very grave.—*L' Union Méd.*, August 5, 1883.

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### *Paroxysmal Hæmoglobinuria.*

Dr. STEPHEN MACKENZIE read a paper on this subject at a late meeting of the Medical Society of London. He commenced by relating three cases. Case

1 was a boy, aged thirteen, who had always lived in the East-end of London. His disease commenced at Christmas, 1881, and lasted till August, 1882. The attacks occurred whenever he went out into the cold air, and only under these circumstances. This occasioned a chill, followed by the passing of water like porter or port wine. In a few hours the urine became quite natural. Case 2 was a man, aged fifty-five, who had an attack eighteen years before, lasting a few weeks. He remained free until the present year, when he again became affected, and the attack lasted three months. Each paroxysm was excited by exposure to cold, when the urine became porter-coloured, and in a few hours, after the patient became warm, it resumed its natural appearance. Case 3 was that of a gentleman, fifty years of age, who had suffered from the disease for twenty-three years. Each attack was invariably excited by cold. The urine between the attacks was natural in colour. This patient had had primary syphilis, but no sequelæ; the others had not; and none of the three had suffered from malaria. Dr. Mackenzie then described in detail the peculiarities of the paroxysmal and inter-paroxysmal urine in this disease. The blood colour of the urine was due to hæmoglobin, as shown by the guaiacum and Heller's tests, and spectroscopic examination, methæmoglobin being sometimes, but not always, present. A few blood-corpuscles were sometimes found, but more often they were entirely absent. The other phenomena of the paroxysm were then described, and what was known of the pathology of the disease was next reviewed. Two things were certain: (1) that blood destruction or dissolution took place somewhere; (2) that this was, in the great majority of cases, due to the influence of cold acting on a morbidly sensitive reflex nervous mechanism. Probably a second factor was present in a peculiarity of the blood-corpuscles. As to where the blood destruction took place the evidence was not quite conclusive, but some recent observations of Boas and others suggested that it was in the exposed parts affected by the cold. Allusion was made to the connection between this disease and the "local asphyxia," or symmetrical gangrene, described by Raynaud, and examples of which had been recorded by Wilks, Southey, Barlow, Mahomed, etc. It appeared possible that in some cases there was an imperfect formation of the blood-corpuscles, which, under the influence of cold, and possibly carbonic acid, parted with their hæmoglobin more readily than in health. Hæmoglobin had been shown in some cases to be present in the serum. It might be that the kidneys were passive, as whenever dissolved hæmoglobin circulated in the blood, the kidneys separated and eliminated it. This was shown in toxic conditions, as in poisoning with arseniuretted hydrogen, naphthol, chlorate of potash, etc., and in certain fevers, as well as in the hæmoglobinuria of cattle and horses. Some sections were shown of the kidney prepared by Dr. Dreschfeld, of Manchester, from a fatal case of hæmoglobinuria from chlorate of potash poisoning. It might be that in some cases the blood destruction occurred in the kidney, but it was certain in some cases that it occurred elsewhere. The few post-mortem examinations that had been made threw no light on the nature of the disease, which occurred at all ages, with a marked predominance in young males. Syphilis had been shown to have been an antecedent in several cases, and the disease had been cured in some such by antisyphilitic treatment. In others malaria was apparently the cause of the disease, though not in all. Rheumatism had been associated with the disease. It was possible in these dyscrasiæ that an imperfect blood formation took place. As regards treatment, syphilis should be inquired for, and when present treated. In the majority of cases quinine was the remedy of greatest service, even in cases evidently not malarial. Probably some patients who got well when taking quinine would have done so without it. Most patients found by experience that the only way to prevent attacks was to avoid exposure

to cold by clothing and habits. But it was possible, as suggested by Dr. Barlow, that gradual accustoming to cold might be at once the most philosophical and successful mode of treatment, and this was decidedly worthy of trial.

Dr. DICKINSON said that he had had large experience of such cases. Sixteen cases had been under his own care, and for one more he was indebted to Sir William Jenner. One fact which came out very prominently from this collection of cases was the remarkable influence which ague or malarial disease seemed to play in the causation. Five of the cases had had ague, and three had resided in a malarial district. In two, other members of the family had suffered from ague; and except in three cases, a strong presumption of malarial influence existed. It must be remembered that malarial conditions of body are very tenacious and come out whenever they have a chance, thereby earning the title of an insidious disease. Paroxysmal hæmatinuria resembled an attack of ague in many ways. It might be said metaphorically that the disease eliminated itself by the kidney rather than through the skin, as in ordinary ague. Then the association of ague and hæmatinuria had been noted, as in a case recorded by Dr. Mackenzie. Dr. Dickinson had had the case of a young woman who had contracted malaria in India under his care. There were undoubted attacks of ague associated with hæmaglobinuria, hemorrhages in various parts of the body, and purpura. Under the influence of quinine the patient got nearly well; but died some time later from perforation of a typhoid ulcer. At the autopsy, the kidneys showed signs of inflammation in the overgrowth of fibroid tissue and in the blocking of tubes. Besides there were many areas of interstitial hemorrhages to be seen around, but not in the Malpighian bodies. That cases get well of their own accord there could be no doubt. And of the value of large doses of quinine continued for a long time, Dr. Dickinson had no doubt.

Dr. Mackenzie replied that he did not ignore ague as an element in the causation of the disease. But there were cases, as in one of his own, where no suspicion of malaria could be entertained.—*Lancet*, Nov. 17, 1883.

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*Cases of Thickened Epidermis treated by Salicylic Plaster.*

At a late meeting of the Clinical Society of London (*British Medical Journal*, December 1, 1883), Dr. THIN gave an account of cases of thickened epidermis treated by salicylic gutta-percha plaster. The plaster which he used was manufactured by Herr Beiersdorf, of Hamburg, at the suggestion of Dr. Unna, who had introduced it into practice.

The first case which he related was that of an adult man, in whom a tendency to extreme tylosis of the soles and palms was hereditary. The palms and soles in this man's case were covered with an extremely thick and hard epidermis, and had been for many years in this condition, the affection having resisted very various methods of treatment. The treatment by the plaster was, in the first instance, recommended by Dr. Unna, and the author simply continued Dr. Unna's treatment. Under the use of the salicylic plaster, which was kept constantly applied by means of bandages, and changed every third or fourth day, the hard layer of epidermis came off in one mass, leaving a delicate rose-coloured epidermis behind it. There was neither pain nor inconvenience connected with the use of the plaster, and the patient, a business-man actively employed, was able to follow his usual avocation without interruption.

CASE II.—A gentleman, aged 72, who had always been healthy, was unable to walk for a period of six or seven months on account of an attack of sciatica. When the sciatica was relieved, he somewhat suddenly resumed his professional employment in the city, which at the time involved a good deal of walking on

the hard pavement. The result was that the soles of both feet became hot and tender, and, after a few weeks, the skin of the ball of each foot became hard and horny. When he consulted the author, this condition had lasted for about seven years, and gave rise to much pain and discomfort. The whole of the surface of the ball of one foot and part of the surface of the other were covered with a layer of epidermis of extreme hardness. In this hard layer, there were small isolated horny formations of the nature of corns, which produced the same sensation as if the patient were walking on shot, or small hard stones. The first treatment recommended was the application of strong solutions of potash, scraping with a sharp spoon, and wearing a horse-hair pad in a large boot. This alleviated the condition, but the application required to be frequently repeated. The salicylic plaster relieved the condition for several months at a time.

Case III.—In a gentleman, aged 43, the palmar surface of the right forefinger had been covered for years by a thick hard fissured epidermis. After this morbid formation had been removed by the salicylic plaster, the skin of the finger had remained normal when the patient was seen by the author nine months afterwards.

Case IV.—A gentleman, aged 40, had suffered from the condition of his heels for about twenty years. It had begun by the skin being red, tender, and scaly, and the hardness had gone on progressively increasing. The condition had been on several occasions mistaken for syphilis, and amongst other methods of treatment which had been employed in vain, several antisyphilitic courses were to be reckoned. When seen by the author, the skin of both heels was covered by thick hard horny uneven masses, which rendered walking very painful. Solutions of potash and a scraper, which were first recommended, had been used faithfully for a year almost daily, but with only temporary alleviation. When the author became acquainted with the specific action of the salicylic plaster it was recommended to the patient. Although by its use the tendency to horny formation was not removed, yet the hard masses had been completely got rid of, the patient could walk with comfort, and with the occasional use of the plaster the fresh formation of hard masses was avoided.

The author regarded the condition of which these cases were examples as being essentially allied to eczema. The formative power of the epithelium was injured mechanically or otherwise, and an imperfectly formed epidermis resulted. By its solvent power on horny epidermis, salicylic acid incorporated with gutta-percha, as in Beiersdorf's plaster, freed the skin from an adherent irritating mass, and the deeper layers of the rete mucosum were placed in more favourable conditions for regaining their physiological properties.

Mr. Butlin said that Mr. Thomas Smith had employed salicylic acid to remove a wart on his own person, the unhealthy appearance assumed by the growth having caused him much uneasiness from its resemblance to an epithelioma. Since this experience the remedy had been used with some success in cases of ulcerating carcinoma, rodent ulcer, etc. In a case of epithelioma of his own, however, he (Mr. Butlin) had not employed the salicylic acid, having agreed with Mr. Smith that, though it might prove of service, yet his duty to the patient demanded more positive and reliable immediate treatment. Hitherto he had known of no real example of epithelioma so cured, and was disappointed at not hearing from Dr. Thin that such results had been obtained.

Mr. M. Baker described a case occurring in the syphilitic female ward at St. Bartholomew's Hospital, in which a number of warts were reduced by application of a cream of salicylic acid and vaseline. He thought the preparation used by Mr. Smith resembled the "corn-solvine" sold in shops, which consisted of a saturated solution of the acid in collodion.

*Histology of Strumous Pseudo-Elephantiasis.*

M. ALBERT MATHIEU has a recent note on this subject.

Independently of elephantiasis, properly so called, or elephantiasis Arabum, there exist a considerable number of cases of false elephantiasis but little known and insufficiently classified. The characteristics common to these different affections are: their long duration, slow evolution, acute eruptions, and deformities of the skin. Pseudo-elephantiasis should be described with lupus scrofulosis, of which it is really only a clinical variety.

The principal characteristics are: 1st. It is situated more particularly on the inferior members; is characterized by a permanent œdematous state of the skin and the subcutaneous tissue, which causes a marked deformity of the leg and foot. Not only does œdema exist, but an induration attributable to chronic dermatitis, which resembles true elephantiasis. 2d. Its situation is different from that of elephantiasis Arabum. The latter produces a considerable swelling of the skin of the lower limbs, which is arrested at the level of the malleoli, leaving the foot almost normal, giving the appearance of a pantaloon below which the foot is seen Strumous pseudo-elephantiasis is characterized in the lower limbs by a swelling which involves both the foot and leg. The thigh is but little affected, and later, the disease slowly ascends toward the hip. 3d. When the œdema and dermatitis have lasted for a certain length of time, papillomatous projections are developed which seem, to the naked eye, to be due to hypertrophy of the normal papillæ of the skin. This is confirmed by microscopic examination. 4th. In certain regions, and more often in those which have been primarily occupied by the papillomatous projections, ulcerations develop, the appearance of which is entirely similar to that of the ulceration of lupus scrofulosis. 5th. The œdema and chronic dermatitis develop by successive cases. At certain times, and under influences often not well determined, there are inflammatory eruptions very much resembling the erysipelatous eruptions of strumous subjects. These inflammatory eruptions are analogous to those seen in true elephantiasis and in old syphilitic and paludal subjects affected with pseudo-elephantiasic œdema of the lower limbs.

In the latter part of 1882 there died at Saint Louis, in the service of M. Lailler, a woman who had suffered with strumous elephantiasis for several years. Histological examination of portions of the skin taken from various places of the lower limbs showed the following interesting peculiarities.

1. *Lesions of the Papillæ.*—In the regions in which the skin commenced to take on a papillomatous aspect, the papillæ were very much enlarged. They were infiltrated by embryonal elements disposed in linear rows. These rows were directed from the bases towards the summits of the hypertrophied papillæ. There was a true lymphoid infiltration of these papillæ.

2. *Modifications of the Epidermis.*—The epidermic layer was very much thickened. The superficial cells were swollen, voluminous, sometimes containing vacuoles, always separated from one another by an interstitial substance. The stratum lucidum was very marked, and was strongly coloured by picric acid. The interpapillary depressions were deeper when the papillæ were larger. Perhaps, however, the increased size of these spaces was not due simply to the increased dimensions of the papillæ. In certain places there were found anastomotic spaces which penetrated deeply into the subjacent tissue. These spaces, which resemble an irregular network, are made up of flattened and piled-up epithelial cells. In other points are found lobulated masses similar to the collection in the bulbous roots of certain epitheliomata. It seems then that the epithelial layers are encroachments. Furthermore, it is to be remarked that in the points in

which the lesion is least advanced, one may easily distinguish the deep layer of the epidermic cells from the interposed cells, while in the anastomosing spaces only masses of pavement cells can be recognized.

3. *Ulcerations.*—Papillary and epidermic lesions are found in the circumference of the ulcerations. As one comes nearer to the ulcerations in the examination, the embryonal elements become more numerous, and finally are so abundant that it is impossible to find any trace of normal dermal elements. On the borders of the ulceration it is seen that the pavement layer disappears, then the deep layer of the epidermis, and finally the papillæ. The depth of the ulceration is made up of a layer of very numerous embryonal elements, between which are perceived here and there the spaces of epithelial origin already described. It seems at certain points that the embryonal elements united in small rounded masses, as arranged in the form of tuberculous nodules, and in fact one sometimes sees, toward the centre, yellowish opaque masses made up of elements which seem very like giant-cells.

4. *Lesions of the Subcutaneous Tissue.*—The sudoriparous glands are inflamed, their epithelium being in process of proliferation and desquamation. It will often be found that the embryonal portions have followed their excretory canals from the surface toward the deeper portions, and lymphoid masses are formed around the glands. Other elements are found along the vessels, others still are completely isolated. It is probable that some may be found in lymphatic trunks. The cellular tissue appears to be thickened, and the fasciæ are indistinct; they seem to be glued up with a semi-opaque celloid substance. The layers are well coloured by violet and methylaniline; this colour is found in the walls of some sudoriparous glands, of arterioles, and in the thickened layer which the stratum lucidum forms. It seems, therefore, that amyloid degeneration exists in these different points.

The histological examination appears to be in favour of the similarity which was stated, in the beginning of this note, to exist between pseudo-elephantiasis and lupus scrofulosis. Are these lesions related to tuberculosis? Boiteux reports a case in the *Revue de Chirurgie*, 1881, of a young girl having ulcerations and strumous osteitis of the toes which seemed to be due to successive cases of erysipelas or lymphangitis *en masse*. There was chronic œdema with dermatitis of pseudo-elephantiasic appearance. Histological examination showed the existence of abundant embryonal infiltration of the skin, and numerous tubercular follicles. With this case is cited one of true elephantiasis, contracted in a warm climate, in which cutaneous sclerosis predominated, the comparison of the two making the difference very striking.—*Le Progrès Méd.*, Dec. 1, 1883.

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## SURGERY.

### *Removal of the Tongue.*

Mr. W. Morrant Baker read a paper on this subject at the fifty-first annual meeting of the British Medical Association, in which he said that the important matter in all cases is, that there shall be a large margin of healthy tissue removed with the cancer; and this is quite easy of performance by any method. Such cases, however, are exceptional; and, in the others, in which the disease extends at least to the level of the last molar tooth, or invades the mucous membrane of the floor of the mouth or the gum, or in which there is more or less abnormal

fixity of the organ to neighbouring parts, the choice of operation is of consequence. As before, however, the most important question, by far, is this: How can the disease be most completely removed without undue risk to the patient's life?

I do not propose to consider here the comparatively rare cases in which the disease cannot be removed without complete division of the lower jaw. Such cases form a class by themselves, and may or may not be best dealt with by median division of the tongue and the use of the *écraseur*. I will assume that section of the bone is not necessary, and that the operator has decided to use the *écraseur*. Under such circumstances, the following is the plan which I believe is the best to be adopted:—

A gag having been introduced, and any jagged teeth likely to be in the way of the operator having been extracted, two threads are passed through the tongue, about an inch behind the tip and half an inch on each side of the middle line. One of these looped threads is now given to an assistant to hold tightly; and the operator, holding the other, scores the dorsum of the tongue with a blunt-pointed scalpel, exactly in the middle line—extending the "cut" well through the mucous membrane in the surface of the muscular substance, and dividing the tip freely down to and through the middle line of the frænum. The cut may be extended back as far as the operator deems necessary—say, for an inch beyond the level of the posterior edge of the cancer. He then takes both threads, one in each hand, and, using the forefingers much in the same way that he would for tightening a ligature on a deep vessel, he splits the tongue into two halves. At this stage of the operation, the hemorrhage is usually very trifling, if the operator has taken care to cut along the middle line; and, even if he is a little to one side or the other, the divided vessels are small and easily ligatured. The thread which tethers the diseased half of the tongue is now pulled quite taut, either by the operator or his assistant; while the former, with blunt-pointed scissors, snips, as far as he considers necessary, the mucous membrane and muscular fibres which connect the tongue with the anterior part of the lower jaw behind the symphysis, after the manner suggested many years since by Sir James Paget. He then "runs" the scissors along the floor of the mouth, immediately beneath the mucous membrane, keeping close to the ramus of the jaw, until he has cut, if possible, to a point beyond the level of the posterior edge of the cancer. Then, with his forefinger and by occasional snips with the scissors, he frees the tongue as completely as may be requisite from its attachments in front and at the sides and in the floor of the mouth. The chief point aimed at, of course, at this stage of the operation, is to free the diseased half of the tongue in such a manner that it may be surrounded by the loop of the *écraseur* at some distance behind the disease, and without danger of the cord slipping forward so as to embrace the neighbourhood of the cancer, and much less the cancer itself.

This is by far the most important part of the operation; and, should the surgeon be in doubt about his having sufficiently freed the tongue with his finger, he should again introduce the scissors, and cautiously divide any muscle or other structure which prevents the due loosening of the tongue. Having now freed the tongue sufficiently, one, and sometimes two, blunt curved needles (of the pattern shown) are now made to perforate it at some distance, an inch, or more if possible, behind the cancerous mass; and the loop of the *écraseur* is now slipped over the diseased half of the tongue, and adjusted behind the needles. With the screwing-up of the *écraseur*, this part of the operation is now completed, with the exception that, very commonly, at least when whipcord is employed, the main vessel and some other tissue, perhaps nerve-fibres, are pulled through the end of the *écraseur* after the softer substance of the tongue has been

crushed through. Under these circumstances, a double ligature should be passed with an aneurism-needle, and the strand of vessels and nerves divided between the two knots, when the *écraseur* will, of course, at once come away, and the main vessels will be left on the face of the stump securely ligatured.

In the event of both sides of the tongue requiring removal, an *écraseur* should now be slipped over the other half after it has been sufficiently freed from its attachments, and the diseased part guarded by a blunt-pointed needle. This part of the operation, on account of the space gained by the removal of half the organ, can be performed with comparative ease and rapidity.

After the removal of the tongue, wholly or in part, as the case may be, it should be carefully examined with reference to the question of how much healthy tissue has been removed with the cancer; and the floor of the mouth and stump of the tongue should be carefully examined also, with the same object in view. In freeing the tongue from the floor of the mouth, portions of mucous membrane, sublingual glands, and the like, are often loosened; and these can be readily dissected away when space has been gained by removal of the tongue. Lymphatic glands should also be searched for, especially in the submaxillary fossa. Should any be found, now or previously, an incision should be made through the skin over them, and they should be carefully enucleated.

In many cases, the removal of the tongue is greatly facilitated by previously dividing the cheek from the angle of the mouth to the anterior border of the masseter—a little below the line of the parotid duct—as recommended by Collis, Gant, Furneaux Jordan, and many others. This should be, I venture to think, always done if the disease extend far back. The scar is afterwards but trifling, if a little care be taken in applying the sutures of union.

It is often advisable, especially when the disease has advanced into the mucous membrane of the floor of the mouth, to extract three or four of the neighbouring teeth from the lower jaw; and, when the disease approaches or invades the gum, much valuable space may be gained (much more than would be imagined by one who had not done it) by cutting away also a portion of the alveolar border of the lower jaw.

With regard to the *écraseur*, the choice of instrument is a matter of secondary importance; at the same time, it is not unimportant altogether. The instrument which I have been in the habit of using of late is of very moderate length and weight, and is somewhat curved on the flat near the end. (Pattern shown.) The pattern is almost identical with that which my colleague Mr. Harrison Cripps has recommended for removal of the lower end of the rectum; but I prefer working both limbs of the looped cord at the same time, and therefore have a double instead of a single hook, and have no perforations at the shoulder of the instrument. The material of the cord which I much prefer to any other is a thick kind of whipcord. (Specimens shown.) It is more easily manageable than any kind of wire, and very much more than the linked chain. For some years past I have not met with any case in which the cord has broken under the strain of cutting through the tongue; nor have I ever had, so far as I can remember, any case of recurrent hemorrhage after the operation. This last advantage I am inclined to attribute partly to the fact that a whipcord or wire loop, and more especially whipcord, will, usually, after the tongue has been crushed through, drag through the end of the *écraseur* a small strand of tissue containing the chief vessels, to which a ligature can be applied before the removal of the *écraseur*. The being able to tie the main vessel at the end of the operation enables the operator to screw up the *écraseur* more rapidly than he would have otherwise ventured to do. I think it is a good plan to apply a ligature to the main vessel,

if it can be seen on the face of the stump, if it has not been tied before the removal of the *écraseur*.

I have now removed the tongue, wholly or in part, thirty-six times, and in all but three by the method here described. Of the thirty-five patients (one of whom was operated on twice, at an interval of four years and a half, thus making the thirty-six operations), thirty recovered, and five died. Of the deaths, one was from diphtheria, beginning about ten days after the operation; two from septicæmia; and one from general debility, arising chiefly from other causes than the cancer of the tongue; and one died six weeks after the operation from subacute pneumonia, the symptoms of which began about a week after the operation, with cough and slightly raised pulse and temperature, and consolidation of the base of the left lung. All the symptoms proceeded quietly to the last, the patient having recovered quickly from the immediate effects of the operation, and being able to take carriage-exercise for some weeks to within a day or two of his death. The sputa were offensive, and I have no doubt that the inflamed lung-tissue had in part broken down.—*British Med. Journ.*, Oct. 20, 1883.

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*Colotomy in Syphilitic Ulceration of the Rectum.*

In a paper on this subject Dr. EUGENE HAHN says that it has not yet been determined whether the so-called syphilitic ulceration of the rectum, which is exclusively confined to females, and can often be observed in syphilitic women, is certainly of syphilitic origin or not; whether they must be attributed to the secondary or tertiary period; or arise from mucous patches, condylomata, or gummous nodules; or whether they are not of a syphilitic nature, and arise from infection with gonorrhœal secretion, or are the product of infection from a soft ulcer, is still unsettled.

Hahn has seen fifty cases and made about thirty autopsies, and is confident that he has seen some cases of the so-called syphilitic ulceration of the rectum which could not have been attributed to a syphilitic origin.

The views of different authors on this question differ widely. Some, as von Bärensprung and Fournier, hold to the syphilitic nature of this ulceration, and assign it in different periods to mucous patches or to gummata. Fournier ascribes it to the tertiary period, and distinguishes between these ulcerative or gummatous forms, and those called by him the ano-rectal syphiloma, which begin in the submucous tissue. Pathological anatomy has not yet determined this question; as Virchow says that he has had no opportunity to observe the first stage of the process, and must, therefore, leave it doubtful whether the ulceration ordinarily has a condylomatous or gummous beginning, or whether it is chiefly of a secondary nature. Its almost exclusive appearance in women favours the primary nature of the disease. As far as the customary local and general treatment is concerned the results are usually very poor.

Antiseptics, astringents, and cauterants, in powder and ointments, slitting of the stricture, the sharp spoon, and the actual cautery, bougies, iodide of potassium, inunctions and injections, all alike seem to be equally inefficacious in many of these cases. The purulent discharge continues, and the patient goes on from bad to worse. Some die from the great drain on the system, with amyloid degeneration of the different organs, others of pyæmia or septicæmia. It occurred to Hahn that if the fecal matter could be kept from the surface of the ulcers of non-syphilitic nature, they could be cured by judicious treatment; and by anti-syphilitic remedies; if they were of specific origin, they could be cured. He, therefore, proposes colotomy, and reports the following case:—

A woman, æt. 25 years, prostitute, with a severe rectal affection, came under

his care. The purulent discharge, in spite of the most assiduous treatment, continued to be enormous, amounting to about a litre per diem. Different antiseptics, astringents, and cauterants were tried in vain, as was general treatment with iodide of potassium and mercury. The same treatment had been tried in other hospitals without success. The patient was losing strength and flesh daily, until finally she was reduced in weight to 68 pounds. Examination showed a complete rupture of the perineum, with a large cloaca between the vagina and intestine. The sphincter ani was torn and powerless. He performed left anterior colotomy with the most excellent results. The purulent discharge ceased within fourteen days of the operation, and the patient began rapidly to gain in strength and weight. Other cases in which this treatment was successful are reported. One, a patient operated upon a year ago, had had, for some time, an enormous purulent discharge, which rapidly diminished after operation. In this case local treatment really did harm, for the introduction of bougies always caused a greater or less degree of peritonitis. There was a recto-vaginal fistula in Douglas's pouch, which he cured by the following operation: The mucous membrane of the vagina was freshened to a considerable extent around the fistula; the cervix was slit bilaterally, the posterior flap freshened, brought into contact with the freshened mucous membrane, and the two sutured together. The purulent discharge from the rectum continued, and colotomy had to be performed about a year after the first operation. On account of using a bad pessary there was a prolapse of the colon. This can be avoided, he says, by the use of a good rubber pessary. Three of his patients died within from eight months to two years and a half of intercurrent disease. In all three there was a marked bettering of the condition, both in regard to the lessening of the discharge, and general health. In none were there any good results from anti-syphilitic treatment. The local treatment was so directed that several injections of salicylic acid, thymol, permanganate of potash or alum were used daily, directed through the peripheral end of the colon by means of an irrigator. For this purpose the patients were placed upon a kind of injection bath, and the fluid injected through the peripheral end of the colon until it ran from the anus in a clear stream. After the first injections had been made and the fecal matter removed, there was a decided bettering of the purulent secretion. Two patients died several days after the operation, one of inanition because the operation was undertaken too late, the other of peritonitis.

On the day before the operation, a purgative is administered to the patient, and a few hours before the operation an enema is given. The operation is always performed in two stages. In the first the patient is chloroformed, the field of operation thoroughly disinfected, and an incision five or six cm. long is made parallel to and about half a centimeter above the outer portion of Poupart's ligament, so that one-half of the incision is above, the other half below the anterior superior spinous process of the ilium. The obliqne and transversalis muscles are now cut through, and every bleeding vessel, even the smallest, is checked. The fascia transversalis and peritoneum are now incised. The parietal layer of the peritoneum is now stitched to the outer skin, and secured by button sutures. Catgut is used for this purpose, being carried through the skin, the whole muscular layer and the peritoneum, and the sutures drawn so that the whole wound is covered by a peritoneal layer, which will prevent extravasation into the subperitoneal tissue. The threads are then cut short. The thumb and index finger are now carried into the abdominal cavity, so as to get at the colon or the upper portion of the sigmoid flexure. The colon is easily recognized by the colic and epiploic ligaments. When the colon has been found it must be stitched with the parietal layer of the peritoneum, which has already been secured to the wound. This is done by means of a thin, slightly curved needle, carried in about one-fifth of an

inch between the visceral layer and the muscular structure of the intestine; then the needle is brought through the parietal layer about one-fifth of an inch from the edge of the wound, and out through the skin, and then the threads of carbolized silk are tied. In this manner surfaces of peritoneal tissue about one-fifth of an inch wide are brought together; after five or six days they become so closely adherent that there is no fear of their separation. Eight or ten sutures are put in place, and the threads left hanging out; this he considers as important, because after six days the colon and the whole wound become covered with granulations, and the colon cannot be certainly recognized. In one case, through the neglect of this precaution, the peritoneal cavity was opened during manipulation of the wound, and fatal peritonitis ensued.

By leaving the threads the situation of the colon can be easily determined when the time comes for opening the gut. This constitutes the second stage of the operation, and is generally performed six days after the first. This procedure being generally painless, the patient is not anæsthetized. The threads are pulled apart and cut in the middle until the mucous membrane of the gut is seen, or the colon is seized with two fine, sharp tenacula, and cut through between them. Tenacula are better than pincers, because when the intestinal wall is seized with sharp pincers a slight bleeding will ensue, which obscures the field of operation. If it is necessary to enlarge the wound into the gut, scissors may be used. After a few days the use of injections may be begun.

An accident which very often happens when the patient gets up is prolapse of the intestine. On this account it is of great importance not to make too large a wound, and, as soon as the patient gets up, to fit in a proper pessary. The air-filled rubber ring will be found very advantageous for this purpose.

As to the relative danger of anterior and posterior colotomy, Hahn gives the following reasons for preferring the anterior operation: 1. After anterior colotomy the patient can clean herself and make the injections without assistance. 2. The operation can be more easily and nicely performed. 3. Up to the second stage of the operation, or the formation of granulations in the wound, complete antisepsis can be more completely carried out.—*Langenbeck's Archiv*, Bd. xxix. Heft 2.

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*Piece of Bone passed through the Bladder.*

Mr. REGINALD HARRISON, at a late meeting of the Medical Society of London, described a case in which the lower epiphysis of a rabbit's femur passed from the bowel into the bladder, and thence per urethram. The gentleman, the subject of this condition, at first presented a tumour in the region of the fundus of the bladder, associated with vesical irritation and severe pain at the lower part of the abdomen. The urine contained pus. He was sounded, but nothing was detected in the bladder, and soothing treatment was adopted. A later examination of the urine showed the elements of feces, and air now escaped on micturition. One day he passed the piece of bone referred to, and subsequently the symptoms gradually subsided. For a long time his chief trouble was that, when the bowels were loose, fecal matter would block the urethra; but by the use of small doses of opium, regularly emptying the bladder with a soft catheter, and daily washing out, the fecal fistula gradually closed, and the patient was now in perfect health. If the above means had not succeeded, Mr. Harrison would have performed cystotomy in order to obtain perfect rest of the bladder. He had reason to believe, from abdominal examination, that the piece of bone was impacted in the transverse colon, which had then contracted adhesions with the bladder and opened into it, thus providing an exit for the foreign body, so unusual an occurrence that he could find only two similar cases on record.—*Lancet*, Nov. 17, 1883.

*Resection of the Knee.*

One of the most important contributions to practical surgery during the present year is an original memoir (*Revue de Chirurgie*, Nos. 4 and 5, 1883) by Professor OLLIER on resection of the knee, giving the results obtained from this operation in the surgical clinique of Lyons during the year 1882. He states that formerly he was opposed to this operation, and, on account of the high mortality —75 to 80 per cent.—which followed his first attempts, he thought it preferable, in cases not amenable to treatment by rest, drainage, and incision of abscesses, to have recourse to amputation in the thigh, the mortality of which operation in such cases was about 40 per cent. At the present day, however, owing to antiseptic dressings, the proportion is completely changed. Of seven cases in which resection of the knee has been recently performed by him, one only was fatal; and in this death occurred very soon after the operation, and was due to shock. The mortality of resection of the knee has thus been reduced from 80 to 14 per cent., and the motives which formerly induced the surgeon to abstain from performing this operation no longer exist. The use of Lister's dressings, with which M. Ollier associates iodoform, have completely changed the conditions of operative surgery in the clinique at Lyons. As an example of this, he states that, during the six months just previous to the date of his paper, he had performed twenty-two major operations (resections of large joints, amputation in the thigh and leg) without having had a single bad result through infection. Resection of the knee, which now, in M. Ollier's opinion, claims a place in the first rank of conservative operation, is applicable to three principal conditions: osteo-arthritis, or suppurative fungous arthritis; comminuted fracture, or gunshot wounds involving the joint; anchylosis in a bad position. Thus the resection may be pathological, traumatic, or orthopædic.

He does not approve of performing resection of the knee on children in whom osteo-arthritis usually yields to the expectant treatment, and the limb after the resection is likely to become very much reduced in length. He would not, therefore, practise the operation on any subject under the age of eight years and a half. In older patients, the indication for resection of the knee exists not only when the removal of the osseous extremities is absolutely necessary for the preservation of life, but is presented also when it is desirable to remove the source of a suppuration which, though not threatening to become immediately fatal, may prove so at any time, and which condemns the patient to long confinement in bed, and causes all the bad results of a chronic discharge. Formerly, it would have been more prudent under these conditions to undertake a natural cure; but now he holds, it would be blamable not to resect. The operation, when performed at a proper time, will prevent the dangers of articular suppuration, and enable the patient in the course of three or four months to leave his bed and to move about.

In performing resection of the knee, it has been M. Ollier's aim to place the parts in the best conditions for favouring osseous anchylosis, or obtaining a useful new joint in cases where solid union has not been established. Division of the ligaments and ablation of the capsule, as practised in the operations of Park and Moreau, is attended with the disadvantage of destroying the close relations of the osseous surfaces, and leaves the extremities of the bones quite loose in the wound, and deprived of such supporting soft structure as might assist very much in their ulterior union. By preserving the periosteo-capsular sheath, and maintaining the lateral and posterior continuity of this sheath, the surgeon may retain the ligamento-muscular girdle which surrounds the bones, and would keep them together after the operation. He advocates the subperiosteal method of resecting

the knee, but points out that this is not done with the view of forming a new joint. A solid limb is needed to support the weight of the body, and osseous union is the best guarantee against any relapse of the local disease. An H-shaped incision is made, which, however, is smaller than that that was formed by Moreau; on each side of the joint, is made an incision for free discharge, and for the insertion of drainage-tubes. The outer incision is made just in front of the tendon of the biceps, and the inner one just behind the tendon of the sartorius. In making the transverse incision, the ligamentum patellæ is cut through and the joint opened; the lateral ligaments of the knee are not divided. The superior flap is then raised together with the patella. If this bone be found diseased it is removed, its anterior covering of periosteum, together with the continuation of the tendon of the extensor muscles, being carefully preserved. The crucial ligaments having next been divided, the inferior extremity of the femur is projected through the wound and stripped of its periosteum, and the insertions of the ligaments, as far as the line to which it is thought necessary to apply the saw. The extremity of this bone having been removed in the usual way, the end of the tibia is dealt with in a like manner. All masses of thickened synovial membrane are scraped away, and the sawn surfaces of the bone brought together and fixed by two wire sutures. After the application of sutures to the edges of the skin flaps, the ends of the divided ligamentum being also brought together by suture, antiseptic dressings are applied, and the whole limb secured in a splint. This proceeding, Ollier asserts, not only seems to realize all the conditions required for total resection, but is applicable in its primary stage to exploratory arthrotomy, to articular scraping, and to superficial (intra-epiphyseal) and partial resections of the knee-joint. Under these circumstances, it is important to preserve the lateral ligaments and to re-establish the continuity of the quadriceps by suturing the ligamentum patellæ. The tendino-ligamentous girdle having been left intact, the elements of resistance and motility are preserved, and the joint is subjected but to the minimum of disturbance. He, however, would not at the present day compare these partial operations with total resection of the knee. The former are, in certain cases, rational operations, the dangers of which are much diminished by Lister's dressing and iodoform, but they are attended by the disadvantages of all operations that are too conservative—they expose the patient to the risk of relapse. The patella has always been removed by him; and it is considered prudent not to leave this bone in resection of the knee in the adult, when it is deprived of its cartilage and more or less diseased internally. This practice is a guarantee against relapse of osteitis and of fungous disease of synovial membrane. M. Ollier would not, however, adhere strictly to this rule, and thinks that the patella might well be left in cases of traumatic arthritis, particularly in infants. When this is done, it is necessary to increase the number of drainage-tubes. In preserving the patella when sound, in cases of some other lesion of the joint than osseous or synovial tuberculosis, the surgeon might gain the same advantages which he seeks to obtain by preserving the lateral ligaments and the capsule; that is to say, around the line of reunion of the bones there is an addition to the tissues, serving to augment the solidity of the limb. If firm union fail to be established between the bones, the presence of the patella would probably favour the compatibility of articular motility with usefulness of the limb.

In dealing with enlarged granular masses of synovial membrane in resection of the knee, the surgeon's practice should vary according to the nature of the arthritis. In articular disease of traumatic or rheumatic origin, these granular masses are converted into stable cicatricial tissue after the removal of their superficial layer, but in tubercular arthritis it is necessary to remove all the diseased synovial membrane and to apply the actual cautery to the raw surface. In cases

where well-marked gray granulations exist, and where large masses are observed of caseous material, or of pale and slightly vascular granulations extending under the periosteum, amputation is preferable to resection. Since the introduction of antiseptic dressings, the prospects of treating severe open injuries of the knee by resection have much improved; and, at the same time, these dressings, by preventing those bad results which resection is intended to remedy, are likely to diminish considerably the number of cases of resection, and to widen the field of non-operative conservative surgery. There will, however, always remain a certain number of cases of comminuted fracture of the epiphyses which should be treated by resection, as, for example, when the condyles are broken up into numerous fragments and a projectile or some other foreign body is present in the midst of the splinters. In a case of this kind, M. Ollier would perform the following operation, which he has not yet tried on the living subject, but which seems to possess several advantages on account of its simplicity and of its favourable anatomical conditions with regard to ulterior renewal of the joint if anchylosis should fail. This consists in a single straight median incision carried longitudinally over the patella and through the tendon of the quadriceps and the ligamentum patellæ, dividing these latter structures into two equal parts. The patella having been divided by a saw into lateral halves, the two lips of the wound are separated, the interior of the joint is exposed, and the extent and situation of the injury fully revealed. The surgeon is then able to do what is necessary, whether simply to remove splinters or foreign bodies, or to perform resection.

In two of the seven cases of resection of the knee recorded in this memoir, the operation was performed for osseous anchylosis. This condition had been the result in one of these instances of extension of inflammation from the juxta-epiphyseal region; in the second, of acute traumatic arthritis. In dealing with anchylosis of the knee by operation, the surgeon has hitherto had the choice of two methods of procedure: cuneiform excision of the femur above the articulation; resection of the osseous extremities which formerly constituted the joint. The second, he states, is that most frequently indicated, and is the only operation applicable in cases where the extremities of the bones are still diseased; where there are patches of osteo-myelitis in the condyles of the femur; and where open sinuses still exist and lead down between the bones. The operation of cuneiform excision of the femur may doubtless be often applied, but in cases where it is not necessary to interfere with the old joint, and where there is no diseased tissue to be removed, this cuneiform resection, in his opinion, should be replaced by a simple supracondyloid osteotomy, or better still by a bloodless operation, that is to say, by femoral osteoclasis. This supracondyloid fracture is with Ollier the "method of election," whenever such operation is applicable and especially in anchylosis of traumatic or rheumatic origin. In such cases, he would not hesitate to have recourse to osteoclasis, if the amount of flexion at the freed knee did not pass beyond a right angle. Osteotomy, it is allowed, has no great danger if performed antiseptically, but still it is not so harmless a proceeding as osteoclasis. That method should be chosen which enables the surgeon to obtain the same orthopædic result without a wound and yet with equal precision.

This memoir concludes with the following summary. 1. Antiseptic dressings have completely changed the indications and prognosis of resection of the knee. As formerly it was accounted wise and prudent to reject this operation, or at least to limit its indications in hospital practice, so now it would be considered unreasonable to continue to amputate the thigh in cases where resection is applicable. 2. In young subjects, on account of the dangers of resection with regard to ulterior lengthening of the bone, it is still necessary to insist on a methodical expectant treatment in suppuration of the knee, and on the employment of such

relatively simple means as arthrotomy, articular scraping, drainage, etc. The surgeon might have recourse in the place to these means at any age, but he should always prefer resection to amputation, except in dealing with severe forms of tubercular arthritis, for which the latter is the proper operation. 3. The gravity of resection of the knee is not greater at the present day than that of amputation through the thigh. The cases recorded in this memoir show that in resection of the knee success is now the rule where formerly it was the exception, and that the surgeon must be guided by other motives than the gravity of the operation in deciding between amputation and resection. 4. Endeavour should always be made to obtain osseous anchylosis after resection of the knee; but it is necessary in this operation to try to insure a strong articulation, in case, for some reason or other, anchylosis might fail. 5. The subperiosteal method allows the surgeon to attain this result. The sawn surfaces of the bones are thus left surrounded by abundant ossifiable tissue; and in cases where osseous union does not result, a complete ligamento-muscular girdle is preserved around the new joint. 6. From the scarcity of the observations that have hitherto been recorded, it is yet impossible to estimate the value of resection of the knee in military surgery. It may be presumed, however, that in future campaigns results may be obtained as good as those of modern civil surgery, if only the wounded can be treated with ordinary care. 7. In resection, a transverse incision is recommended together with two lateral vertical incisions. These incisions should not be so extensive as those that were made in Park's operation, and the lateral ligaments of the knee should be left intact. On each side of the joint, far back and near the posterior margins of the condyles, a deep vertical incision is made for the purpose of drainage. 8. In cases of chronic intra-articular suppuration, it is usually found necessary to remove the patella, its anterior covering of periosteum being preserved. The continuity of the ligamentum patellæ should be re-established by nature. 9. In the operative treatment of comminuted fracture of the articular extremities of the bones, a longitudinal incision is to be preferred to transverse incisions. A medium longitudinal incision in front of the knee, dividing the patella into two lateral halves, facilitates the operation, and preserves all the constituent elements of a new joint, and at the same time favours anchylosis, if this result be intended. 10. In osseous anchylosis of the knee, supracondyloid osteoclasis should be the method of election. This operation is especially applicable in cases of anchylosis of traumatic or rheumatic origin, when flexion does not reach or exceed a right angle, and when there are not any deep-seated and multiple cicatricial bands in the popliteal spaces. 11. Whenever there is a risk of lacerating any of the popliteal vessels or nerves inclosed in cicatricial tissue, it would be better to have recouse to supracondyloid osteotomy or to resection. It would be necessary in such case always to practise total resection of the condyloid expansions of the femur, if the cicatricial adhesions be deep-seated and multiple, and if the leg be flexed beyond a right angle. 12. Resection of the condyloid expansions is the only operation to be proposed when signs of inflammation of bone are presented. In a case of flexion of the leg passing beyond a right angle, the surgeon must remove not merely a wedge-shaped bone, but must take away some thickness of the posterior portion of the femur. This is the sole means of bringing the surfaces of section into contact, without exciting painful tension in the popliteal region and interfering with the circulation of the limb.—*London Med. Record*, Oct. 15, 1883.

## OPHTHALMOLOGY AND OTOLOGY.

### *Treatment of Painful Corneal Ulcers by Warmth and Eserine.*

In an introduction to a discussion at the Fifty-first Annual Meeting of the British Medical Association, Mr. CHARLES HIGGINS states that painful ulcers of the cornea are of very common occurrence amongst the debilitated and ill-fed people who make up a large proportion of hospital out-patients. Ulcers of the cornea, as is well known, are much more frequently met with among children than in adults; the phlyctenular ulcer being, perhaps, the most common form. It is not to these, however, that I wish to draw attention, but to the very painful serpiginous ulcers, sometimes known as marginal or crescentic, and the sloughing or suppurative ulcers of older persons.

The serpiginous ulcer is generally met with in feeble women rather past the middle of life. It commences as a thin ulcerated band near the margin of the cornea. The ulcer has a steep, cleanly cut, crescentic edge towards the centre of the cornea, and is flattened towards the corneal margin. The crescentic border gradually spreads over the surface of the cornea; but, as it advances, healing takes place behind it. The ulcer is accompanied by marked conjunctival and ciliary injection; and a network of very fine vessels follows it from the circumcorneal zone over the corneal surface. The ulcerated edge is preceded by infiltration and opacity of the cornea. The pain is very severe, and there is much photophobia. The ulceration rarely extends beyond the centre of the cornea, but may commence at more than one spot, and so implicate the greater part of it. It is extremely intractable and rebellious to treatment, but appears more amenable to that recommended in this paper than any other.

Sloughing and suppurative ulceration may arise spontaneously, or may be caused by injury, such as a sharp blow on the cornea from a rebounding twig or thorn, or any small foreign body. The ulcers form on any part of the cornea; we may meet with them as deep sloughy evacuations, or as collections of pus often having more the character of abscesses than ulcers, but which, sooner or later, burst externally or into the anterior chamber, leaving a ragged ulcerated cavity. This form of ulcer is often associated with hypopyon or onyx, and not unfrequently with abscess in the iris.

The treatment by warmth and eserine is very easily carried out. The patient is directed to foment the eye for fifteen or twenty minutes three or four times a day, or oftener. The fomentation should be used as hot as can be borne, and may consist of simple hot water, decoction of poppy-heads, or chamomiles. A solution of one or two grains of sulphate of eserine to an ounce of water should be dropped into the eye three or four times a day, after the fomentations have been used. A large pad of cotton-wool, thoroughly warmed before a fire or over a spirit-lamp, should be laid upon the closed eyelids, and secured by a bandage, and replaced by a freshly warmed one as often as may be necessary for the patient's comfort. The patient should be allowed to go about; dark rooms and confinement to the house always make matters worse. He should be well fed, purged, if necessary, and placed on some tonic, none being better than iron in some form or other. Stimulants are rarely needed, and in many cases will do harm.

The treatment by warmth without eserine is most useful in many painful inflammations of the eyes. It was first, I believe, recommended by Mr. Liebreich.—*Brit. Med. Journ.*, Nov. 3, 1883.

## MIDWIFERY AND GYNÆCOLOGY.

### *Puerperal Eclampsia.*

Dr. J. E. BURTON, after summarizing the views and facts regarding puerperal eclampsia, concludes:—

1. That puerperal eclampsia is a motor-neurosis associated with loss of consciousness.

2. That it stands in intimate relationship to the convulsions of childhood and to epilepsy.

3. That only one factor in its production is constant, viz: a peculiar condition of the nervous system that may be designated as one of "unstable equilibrium," and that this factor is common also to the convulsions of childhood and to epilepsy.

4. That retention of urinary constituents, when present, vastly increases the tendency to convulsions in pregnancy, but that outside the conditions of pregnancy and childhood such retention is but rarely the cause of convulsions.

5. That nerve irritation—shock, emotion, violent pain, uræmic or other morbid condition of blood, etc.—is capable of setting up sudden vaso-motor spasm of cerebral bloodvessels.

6. That this spasm of bloodvessels, causing sudden anæmia of the brain, is the cause of the convulsions, and, I would add, of the consequent coma.

Dr. Burton reports an interesting case in which he bled to ℥viij, but with little effect. The patient remained comatose for three days and was thoroughly exhausted by the violence and long continuance of the convulsions. For three days she had had no food or medicine except by the rectum, for the coma was so deep that the reflex irritability of the palatal and pharyngeal muscles was absolutely lost. Whatever fluids were put into the mouth, no efforts of swallowing followed.

At this time he determined to inject some food into the stomach. He procured a No. 12 male catheter, and, by means of a piece of India-rubber tubing, attached it to a Higginton's syringe. He then mixed a breakfast-cupful of milk with an ounce of brandy, and about a drachm of Liebig's extract of beef. For an epicure such a compound would perhaps not be palatable, but it was not intended to touch the palate of the patient, so that the flavour was a matter of indifference. He then passed the catheter into the stomach and injected the whole of the mixture, with the comfortable feeling that at any rate the poor creature would not die of starvation. Within an hour consciousness returned, and from this time she was able to swallow. Her progress towards recovery was now uninterrupted.—*Liverpool Med.-Chir. Journ.*, July, 1883.

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### *The Use and Abuse of Pessaries.*

This subject has before now been discussed from the point of view of the proper selection of cases in which pessaries are or may be useful. The subject has various bearings. In the first place, the statistics of Vedeler and Herman show that anteflexion is more normal than any other condition in multiparous women, and that flexions, as flexions, do not, as a matter of fact, cause dysmenorrhœa. It is impossible to conclude that, if flexions do not cause the most direct of all uterine symptoms—dysmenorrhœa—they will cause the symptoms known as indirect or remote, for a test of which we refer our readers to the text-books *passim*, and which include almost every ailment to which female flesh is heir. This being the case it follows that flexions, as flexions, should not be treated. But, secondly, we will suppose a typical case in which pessaries are known to do good—namely, more or less descent of the uterus, with or without

retroversion or retroflexion (which are most probably indications of descent), and we will suppose a pessary to be inserted—what amount of attention (*i. e.*, attendance) should this entail? Undoubtedly a woman wearing a pessary should not be sent away ignorant of its presence, and without any directions. She should, therefore, be informed, that such an instrument has been inserted; and she should be given certain directions. Thus, it is advisable at once to tell her that it is well to wash out the vagina once or twice a day with simple water, which will prevent secretions from accumulating, decomposing, and causing an unpleasant smell (which in some cases is bad enough to suggest the presence of cancer); she should also be told that soreness, itching, or profuse discharge indicates that the pessary should be seen to, and, generally, that it should not be worn without being seen to three or four times a year. It is also usually advisable that the doctor should satisfy himself in a week or so that the pessary is doing good, and doing no harm, and then, having once started the treatment, the patient should be left to test its efficacy. Now this test implies the removal of some symptoms or symptom, which may justly be attributed to some former morbid condition, and it also implies the locomotion of the patient. Generally speaking, a patient lying down is better without a pessary, whatever displacement is present; thus it is rare for even complete procidentia not to reduce itself, or become much smaller, when the patient lies down, and the symptoms of partial descent, which (if there are any symptoms at all) will include almost certainly a sense of weight and dragging pain in one or other iliac fossa, will disappear, or become greatly diminished, in the recumbent position. A pain which is better when the patient is standing and worse when she is lying, should be regarded with suspicion if supposed to be due to descent or displacement: it is probably nothing of the kind. Thus it is to relieve pains increased by standing that pessaries are most generally useful. If this is not effected, the uterus may be unquestionably in the "normal" position, but the pessary is useless, and, if useless, injurious.

Thus, the proper use of pessaries is first, in most cases, after the insertion of the pessary, to get the patient on her legs; secondly, to satisfy one's self in a few days that it is doing good and is doing no harm; but as soon as both these objects are attained, to send the patient away to test the treatment, with the above directions. It should not be the task of months to fit a woman with a pessary, any more than with a truss.

The following are *not* instances of the proper use of pessaries. To keep the patient in bed for long periods wearing a pessary; to see her every day, every other day, twice a week, for weeks, months, or years. Perhaps such visits are not made to the patient, but to the pessary. However that may be, it is not the pessary, but the patient, who has to pay. What should we say of a surgeon who called for months to see a patient to whom he had given a wooden leg or a truss, and who kept him in bed for long periods; or of an oculist who had fitted a patient with spectacles, and saw him every day for several months, whether the spectacles seemed to suit him or not? It is true that the pessary is a truss in the dark, but that is no reason why the management of a pessary should be a deed of darkness.

Recent investigations have shown that the whole question of displacements has to be reconsidered. It cannot be too widely or too dogmatically stated that prolonged treatment by pessaries, such as we have described, is quite inadmissible and unnecessary; and if unnecessary, injurious not only to the patient—*i. e.*, to her *morale* as well as her purse,—but also, in the best sense, to the practitioner, and if to the patient and the practitioner, then to the public and the profession. It should also be realized that a pessary is a mere form of truss, and that its operations, though removed from the general view, are not occult. Ill-treatment

bids fair to bring this useful form of truss into disrepute, and we are daily expecting to meet the practitioner whose sensitiveness is such that he shrinks from a cure whose name he has learnt to mistrust and dislike; but we feel bound to say we have not come across him yet.—*Lancet*, Nov. 10, 1883.

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*Castration for Uterine Fibroma.*

Dr. WIEDOW, of Freiberg, read a paper on this subject in the Section of Gynæcology at the fifty-sixth deutschen Naturforscher versammlung, in September, 1883.

WIEDOW stated that the value of castration in these cases had been very differently estimated at different times. When this operation was first introduced, the enthusiasm was very great, and it was performed unnecessarily and in improper cases; consequently it fell somewhat into disrepute. He presented a short review of the cases which have been performed up to the present time. There have been 63 cases, of which 12 ended fatally. Hegar operated 21 times, 3 cases dying, giving a mortality of fourteen per cent. In one of his cases, the patient was very much better for six months, and the tumour had decreased, but then menorrhagia set in and at the same time fluctuation was detected in the tumour. The patient died a month later. The autopsy showed a fibro-cystic tumour, the lymph spaces of which were filled with purulent serum. In this case, as in one of Schröder's, the tumour again grew and became very large; the prognosis is unfavourable in these cases.

The results in the remainder of Hegar's 17 cases were very satisfactory. The menopause came on sooner or later, and the tumours decreased in size. Comparative drawings of the tumours before and after the operations were shown, and four of the patients were exhibited for examination. In reply to a question by Schatz as to whether the functions of the ovaries were not already lost, Wiedow stated that they were not.

Freund reported 6 cases operated on by him. The results were favourable; the tumours shrivelled, the bleeding ceased, returning in one case at intervals of four to five weeks. Only in one case was the result not good; in this a very large tumour developed.

Hegar does not so much consider the size of the tumours as the method of operating, and the dangers of one operation over another are to be carefully weighed. Castration seems to be the least dangerous, and the operation is to be recommended if the tumour is not yet of very large size. He remarked that, at the normal climacteric, there a cystic degeneration of very large fibromata may take place, or first shrinking and then subsequent growth, just as after castration. On this account he thinks the prognosis of castration for very voluminous tumours doubtful.—*Centralbl. f. Gynäk.*, Nov. 3, 1883.

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*The Vaginal Extirpation of Carcinoma of the Uterus.*

At the late annual meeting of the British Medical Association, Prof. CARL SCHROEDER, of Berlin, read a paper on the subject, in which he said:—

The operative removal of cancer of the uterus is always indicated when it is thought possible to remove all the tissue involved by the neoplasm. If this seem possible, or even probable, the only reason for abstaining from the operation ought to be severe constitutional diseases threatening life in a measurable space of time, such as tuberculosis or Bright's disease.

The question whether it is possible to operate radically may sometimes be very difficult indeed to answer, and it would be illusion to suppose it possible to

decide it with the utmost certainty. It is possible, however, to distinguish under not too unfavourable circumstances, with perfect certainty, very small infiltrations, such as occur principally along the lymphatic vessels. For this purpose it is absolutely necessary to narcotize the patient, and to examine her in the dorsal position by the bimanual method. By pulling down the uterus with a volsella, and introducing two fingers into the rectum, the different organs of the pelvis and the pelvic cellular tissue are thoroughly investigated by letting the tissue pass, piece by piece, between the examining fingers. If the uterus be found to have lost its normal mobility, this must give rise to suspicion, although it may be the result of adhesive perimetritis. Hard infiltrations along the sides of the uterus, diminishing in thickness towards the broad ligaments, or small round nodules in the recto-uterine ligaments, are very characteristic of malignant infiltration. Finally, unusual inflation of the cervix shows that the neighbouring cellular tissue has already participated in the carcinomatous process. On the other hand, it is easy to decide by digital examination, as well as with the speculum, how far the neoplasm has extended on to the vagina.

A very important question is, how far up along the mucous membrane of the cervix, and of the corpus uteri, the carcinoma reaches. I believe that we can derive valuable information upon this point from the study of the form in which the neoplasm presents itself. For instance, in the most frequent form, cancroid of the vaginal portion (cauliflower-excrescence) we see these mucous membranes either not at all involved, or only involved at a very late stage of the disease. This is very characteristic, for we often find the cancroid extending far up into the wall of the cervix, excavating the tissue by ulceration, while a piece of the mucous membrane of the cervix, in a state of catarrhal inflammation, but not malignantly involved, hangs over the ulcerated cavity. On the contrary, the cancroid attacks first the mucous membrane of the vagina, next the pelvic cellular tissue, after that the tissue of the cervix, and finally the mucous membrane of the latter.

The second form in which carcinoma occurs, is the primary carcinoma of the cervical mucous membrane (encephaloid). It progresses just in the contrary order. Ulcerating first the wall of the cervix, and then that of the uterus, it extends relatively late beyond the external os on to the mucous membrane of the vagina, and on to the pelvic cellular tissue.

Between these two forms we must place primary cancer of the wall of the cervix (scirrhus). It involves, at an early period, the body of the uterus and the cellular tissue of the pelvis. Besides this, it often perforates through the top of the vaginal portion into the vagina, or towards the cervical canal, attacking the mucous membrane of the cervix very late. Cancroid of the vaginal portion thus leaves the uterine mucous membrane intact, while the cancer of the cervix spares, for a length of time, the pelvic cellular tissue. Besides these forms, the cancer is found primary on the mucous membrane of the body of the uterus, extending thence on to the cervix.

We now come to speak of the removal of the diseased parts. It is always possible to remove the uterus, even if the whole of this organ be diseased. The adjacent parts of the vagina can also be removed if they be involved. I have even performed total extirpation of the vagina successfully on account of superficial primary cancer of the vagina, although a recurrence followed later. Thus the possibility of removing even extensive parts of the vagina must be admitted. It is, however, another question whether it is advisable to undertake extirpation under such circumstances; for, where extensive parts of the vagina are attacked, the deeper tissue will always be found diseased, and the operation will, most probably, not be radical. Admitting that it is possible to

remove small nodules situated above the cervix, or behind the vaginal fornix, there will generally be more germs lying deeper; and to follow these up like the extirpation of the axillary glands after the amputation of the mamma, would be a matter of impossibility. Even when the infiltrated cellular tissue seems to be limited to the parts close to the cervix, an operation in healthy tissue will not be possible; for in pulling down the ulcerated cervix with the volsella, it will tear, and render the operation impracticable.

It is often possible, however, to remove cancroid of the vaginal portion radically, and, under favourable circumstances, also cancer of the wall of the cervix, if they be discovered at an early period. If they be found not to extend higher up than to the internal os, or a little further (for it is possible to perform partial excision above this point), supravaginal amputation can be performed. Cancer of the cervical mucous membrane, and of the body of the uterus, always necessitates total excision of the uterus.[1]

The supravaginal amputation is performed in the following manner: A Museux's volsella is attached to each lip, and the uterus drawn firmly downwards. In some cases, it is then advisable to divide the cervix on both sides up to the vaginal fornix. The knife is now carried around the vaginal mucous membrane, dividing it all around in healthy tissue, and about one centimeter distance from the diseased parts. After this, I push the anterior vaginal fornix, and with it the bladder and its peritoneal duplicature, upwards above the level of the internal os. Then, always dragging the uterus firmly downwards, I cut off the anterior lip transversely, taking care to make the incision in healthy tissue. The hemorrhage is then arrested by suture, deep stitches being taken to unite the vaginal with the cervical mucous membrane, and these being pulled over the stump. The same proceeding is repeated with the posterior lip, during which manipulation the peritoneum of Douglas's pouch is generally torn. Finally, the bilateral incisions are closed, deep sutures uniting the fornix with the sides of the uterus.

Should it be necessary to perform total extirpation of the uterus, this is executed in the following manner: Two volsellæ are again applied to the lips; these pull the uterus as far down as possible. A circular incision is then made in healthy tissue around the cervix, and the vaginal mucous membrane pushed back and upwards, as in the previous operation. Next, Douglas's pouch is opened by a transverse incision, and the uterus is then turned over, so that its fundus appears in this opening. This is not always an easy manipulation. I generally first produce a retroflection of the uterus, then catch the fundus with a volsella, and pull the body of the uterus through the incision in Douglas's pouch. After this has been done, it is easy to separate the peritoneum of the vesico-uterine pouch, leaving the uterus now only attached to the broad ligaments. These are ligatured either with a single ligature, or separately in different portions. Finally, the uterus is cut off close to its side, leaving a broad piece of tissue between the ligatures and this incision, in order to prevent the ligatures from slipping off, a most disagreeable event, which otherwise is likely to occur. After having performed this on one side, it is repeated on the other side in the same manner, this being generally much easier. The wound in the peritoneum is now closed. In stitching it, I generally attach the ligatured broad ligaments to the corners of the wound. They thus form two pedicles, turning their stumps outside, enabling me to stop any hemorrhage that might occur later on. Between

[1] In case of cancer of the uterus, complicated with prolapse, I only removed the body of the uterus, sparing the cervix, which was not diseased. The patient made a good recovery.

both stumps, I leave a small opening for a T-shaped drainage-tube, the end of which, protruding out of the introitus, is wrapped up in salicylated cotton. This cotton is removed as often as it is soaked; otherwise the patient is left quite to herself. The sutures are removed after a fortnight.

The technical execution of this operation is certainly not to be called easy. In order to perform it with skill, the operator must be accustomed to cervical operations, and to the manner of using the knife and ligatures in the depth of the vagina. Above all, it is necessary to take all the possible advantage of the mobility of the uterus, drawing it far down towards the introitus.

The principal danger of the operation consists in the ligatures slipping off the broad ligaments. It is then very difficult to stop the hemorrhage from the uterine or the spermatic arteries, for the stump generally retracts in such cases, and the blood flows upwards into the abdominal cavity.

The operation is very difficult when the vagina is narrow. Thus it is not easy to perform on nulliparæ, and is often impossible on very old women. Besides, it will scarcely be found possible to perform it when the uterus is very much enlarged; for instance, when it has reached the size of the pregnant uterus in the third month. In such cases, it may be necessary to perform Freund's operation—the total removal of the uterus by laparotomy; but this latter operation, as experience has shown, is much more dangerous than the excision through the vagina.

As to the success obtained by the vaginal extirpation, I must admit that it is not yet to be called satisfactory, especially as far as the question of recurrence is concerned. I have lost 7 out of 23 patients operated upon. This I consider a very bad result, for the operation, although a difficult and a dangerous one, ought to make us expect better results. We certainly may hope that it will follow the lead of the other large gynæcological operations, showing a better prognosis as fast as the technical methods become more perfect.

The supravaginal excision is much less dangerous. I have operated on 64 patients with 8 cases of death. Unfortunately, in a great number of my patients I have seen recurrence, in some cases after two or three years. Other cases have withdrawn from my observation, and only very few have remained until to-day quite without recurrence. This might also be a reason for discouraging us. We have, however, the consolation that the operation is performed according to correct principles, and that the prognosis will no doubt improve by and by, especially if the operation be performed early and radically. Besides, even if a recurrence take place, the patient suffers little towards the end of her life, compared with the dreadful suffering produced by ulcerating cancer, for the disease generally does not recur on the cicatrix in the vaginal fornix. It spreads upwards on to the pelvic cellular tissue, and saves the patient from the dreadful symptoms of cancer, from hemorrhage and ulceration. Let it thus be our object to endeavour to improve the prognosis of the operation, and let us bear in mind that the fate of these patients is such that, if only one out of twenty be radically cured, this ought to be considered as a good result, and as a consolation for many cases treated unsuccessfully.

Sir Spencer Wells (London) read a letter received from Professor Olshausen, recording modifications in the published description of his operations up to 1881. These consisted of not ligaturing the broad ligaments until late in the operation, and then using elastic ligatures, which prevented hemorrhage. The elastic ligature was applied by means of a bent aneurism-needle round the broad ligaments. It was essential to leave a considerable amount of cellular tissue to form a long stump, to prevent retraction and slipping off of the ligatures. The operation was performed under an irrigation of a two per cent. solution of car-

bolic acid. After the operation, Douglas's pouch was washed out with a four per cent. solution of boracic acid. A large drainage tube was introduced, the peritoneum being now stitched together. The vagina was packed with loose iodoform gauze. This gauze was generally removed between the fourth and eighth days, and the drainage-tube about the same time. The elastic ligatures, however, remained two or three weeks. This operation he deprecated when the uterus could not be drawn down as low as the vulva. He had performed, or attempted to perform, the operation twenty-eight times during the last two and a half years. In three cases, he had to be satisfied with the supravaginal operation; the patients recovered, but one had vesico-vaginal fistula. In the twenty-five remaining cases, the operation was completed; seven of the patients died: two on the day of operation; three of septicæmia on the second and third days; one of carbolic poisoning on the second day; and one of iodoform poisoning on the sixth day. Besides these, one died suddenly of embolism of the pulmonary artery on the twenty-sixth day. (A similar case had also recently occurred in his practice within the last few days, where he had performed myotomy.) Of the seventeen remaining cases: in two, no return took place for one year; in two, two years had elapsed without a return; in four or five, a recurrence had taken place. He then proceeded to criticize the operation, and to express a guarded opinion as to its desirability. In one case, he had removed the uterus in a pregnant woman; she lived only eighteen months. He called special attention to the danger of injury to the ureters, which appeared to have escaped in the mode adopted by the Germans, in pushing up and stripping with the finger the loose cellular tissue which surrounded the supravaginal portion of the cervix. Such success had not attended other operators. He strongly deprecated any one attempting the extirpation of the uterus, without previously performing the operation on the dead body.

Mr. KNOWSLEY THORNTON was profoundly disappointed with the results given by Schröder and Olshausen, who admitted a mortality of thirty-four and twenty-eight per cent. respectively, the results of the latter being made quite as bad as those of the former by the three incomplete operations, one of which had left the patient in miserable plight with an urinary fistula. In face of such mortality, he was not at all prepared to accept the dictum contained in the opening of Dr. Schröder's paper. It was true that the results of ovariotomy were as bad in the early days, but there could be no comparison between the two operations. Look at the number of patients restored to perfect health by ovariotomy, and look at the number dying miserably with recurrence shortly after extirpation of the cancerous uterus. Dr. Schröder said that, if one case in twenty could be cured, it was worth the general results. He could not agree with this; for what certainty was there that the one patient who was cured really had malignant disease at all? It was very difficult, in the epitheliomatous forms, to be quite certain, even after microscopic examination, that the disease was malignant; and he altogether distrusted examination by touch for defining the limits of the disease. It was well known to every microscopist how these malignant epitheliomata sent out long processes of cells into the neighbouring healthy tissues, often single rows, stretched for long distances up the lymphatics, far beyond the apparently diseased parts. The immediate results must be totally different from those at present obtained, and the after results also, before the operation could be admitted to a place among the legitimate operations in surgery. With present experience, he infinitely preferred the partial operations on the cervix, with the addition of the application of chloride of zinc. He was astonished to find Dr. Schröder placing the mortality of these operations so high; he had not operated very often, but he had never lost a patient, and several had had long

periods of freedom from recurrence. He believed that the operations for the complete extirpation of the cancerous uterus would soon drop out of surgical practice, as they had done in a past generation. The vaginal method appeared to be the best, but it was a poor best in immediate and after results, and usually necessitated leaving the tubes, or a great part of them, lest the pedicles on each side should slip; and what probability was there, that organs, so continuous in structure with the uterus as these were, would be free from the disease?—*British Med. Journ.*, Sept. 15, 1883.

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*Cancer of the Cervix and its Treatment.*

Dr. A. Wynn Williams read a paper on this subject at the late meeting of the British Medical Association. There appears to him to be little or no difference between epithelioma of the cervix of the uterus and those forms of cancer known as medullary tumour growing from the same organ; the difference, if any, depending solely on the nature of the texture of the organ whence originating; the medullary tumour having its origin from the inner textures of the cervix; epithelioma, or the cauliflower growth, from its external covering.

Whenever we have any suspicion that such a disease as cancer exists, no time should be lost in ascertaining whether or not such is the case. Thus, whenever a patient complains of continuous pains in the back, extending down the thighs, especially the left, with irregular and profuse discharges from the uterus, together with discharges coming through the vagina, of a watery, sanious, and offensive character, she should be made to understand the absolute necessity there is to ascertain with certainty the nature of her malady, and of what vital importance it is to her, as the only hope of cure is in the early stage of the disease.

Whenever the disease has extended to the adjacent parts, such as the mucous membrane of the vagina proper, or to the neighbouring glands, or when the uterus is firmly fixed, you must not expect to do more than palliate the patient's sufferings; when, however, the uterus is partially fixed, without ulceration of the mucous membrane of the vagina, much may be done to prolong life.

When we have satisfied ourselves that a patient is suffering from cancer of the neck of the uterus, whether of an epitheliomatous or medullary character (practically there is no difference in the treatment), and the disease is confined to the uterus, we should proceed at once to get rid of as much of the diseased parts as is possible. This I do by means of the *écraseur*, cautery-knife, scoop, scissors, and scalpel; the patient reclining on her back, and under the influence of some anæsthetic.

In cases of epithelioma, or the cauliflower-growth, I remove the neck of the uterus with the *écraseur*, taking as much off as I possibly can without cutting into Douglas's pouch. Having done this, I introduce a large-sized speculum into the vagina, and apply the cautery to any bleeding points; removing at the same time, if necessary, with the cautery-knife, scissors, or scalpel, all diseased portions within reach—preferring the cautery-knife. I then apply a flat cautery freely to the whole of the raw surface, to prevent hemorrhage, and also for the purpose of causing a certain amount of slough. I then apply a plug of cotton-wool smeared over with a solution of perchloride of iron and glycerine, fill the vagina with cotton-wool, and apply a T-bandage. These plugs may be left in for two days, then removed, and the vagina syringed with a weak solution of tincture of iodine and water three or four times a day until the slough has separated. When this has taken place, I apply to any suspicious-looking part a strong spirituous solution of bromine (one drachm of bromine to three of spirit of wine), by means of a small pledget of cotton-wool. This is left in contact

with the wound for three or four hours. By this time, the bromine will have all evaporated. Care must be taken to prevent the contact of the bromine with the wall of the vagina, which is best done by thin pledgets of wool saturated with a solution of carbonate of soda. After passing down the speculum a plug of simple wool, I place over all a piece of gutta-percha tissue, made into the shape of a ball with cotton-wool.

The separation of the slough, or melting away of the diseased tissues, is not completed under a week or nine days. I may observe that bromine does not act as an ordinary escharotic by simply charring, but dissolves animal matter when saturated with it. Whilst this sloughing or melting is going on, the vagina is syringed out three or four times a day with a weak solution of the tincture of iodine. When this is completed, a solution of bromine is substituted; two or three drops of the strong solution to half a pint of water. This process must be repeated again and again until all vestige of the disease is removed.

In the medullary form of cancer the disease is not so easily diagnosed, or brought under the notice of the physician so early, as in the epithelial form, owing to the absence, in the early stage of the disease, of the peculiarly thin, watery, offensive discharge. The discharge is often supposed to be merely leucorrhœal, and the hemorrhage due to excess of menstruation. The physician is thus often not called in until the diseased mass is ulcerated and broken up into shreds. If a patient come to me when the disease exists only as a tumour in the neck of the uterus, I remove the neck of the uterus with the *écraseur*, and then dissect out any portion which might exist beyond the reach of the *écraseur*. It is truly marvellous what a quantity of diseased tissue may be removed from within the uterus without any serious loss of blood.

Having removed all diseased portions as far as practicable, I then treat the case in the usual way with bromine. Should the tumour be broken up into shreds, and the mucous membrane of the vagina be still unimplicated, the case should not be given up as hopeless. By careful manipulation with the instruments before mentioned, I have cut away such a large portion of the diseased tissues as has enabled me to apply the strong bromine solution with success. In many of these cases, again, they only come before us as the raw bleeding surface of a broken-up medullary or epitheliomatous tumour. Indeed, I am inclined to think that the so-called corroding ulcer is often nothing more. These ulcers are to be treated in the same manner as those caused by our own manipulations. Occasionally, when treating these cases, you will come on a hard solid portion. A few years ago, I was in the habit of injecting these with the bromine solution; but I rarely do this now, as it is not altogether unaccompanied by danger. I now proceed in a different manner. I pass a straight cautery-knife right through the hard mass, and, when the slough has separated, introduce a small pledget of cotton-wool saturated with the strong solution of bromine, or introduce it by means of cotton-wool wrapped round a vulcanite stem or sea-tangle. It is not very often that true scirrhus attacks the neck of the uterus; whenever it is met with, the tumour must either be injected with bromine or the neck of the uterus amputated, and then any stump that may be left treated with bromine in the usual way.—*British Medical Journ.*, Sept. 15, 1883.

## HYGIENE.

### *Disinfection Regulations in Berlin.*

In cases of variola, diphtheria, cholera, and typhic affections energetic disinfection is necessary. It is equally obligatory, but not necessarily so rigid in scarlatina, dysentery, and measles. It may be necessary in certain cases of whooping-cough, tuberculosis, contagious inflammations of the lungs and eyes, glanders, charbon, hydrophobia, puerperal diseases, and wound complications.

*Means of Disinfection.*—The disinfecting means are: 1. Washing with lye-soap, prepared by dissolving ʒiiiss of black soap in ten quarts of tepid water. 2. Carbolic acid, one part to twenty of tepid water, well shaken. 3. Corrosive sublimate. This is only employed in the more contagious diseases, and the prescription for its use should be given by the physician. The strength of the solution should be 1-1500. 4. Carbolic-acid spray. The solution for this purpose should be 1-20. 5. Chlorine gas—made by pouring hydrochloric acid on chloride of lime, equal parts; ℔ij ʒviij of chloride of lime is necessary for the disinfection of a large room. 6. Ventilation, obtained by opening the doors and windows and fireplaces. 7. Dry heat and steam. These means can only be used in special establishments. When these do not exist, the same effects may be obtained by the use of chlorine gas. After the use of this gas, the various articles should be exposed to the air for a time. 8. Burning is the best disinfectant for articles of little value.

*Disinfection of Rooms*—(*a*) *Apartments still Furnished.*—1. At the beginning of the disease special care should be taken that only absolutely necessary articles of furniture should be kept in the room; all clothing except that in use by the patient at the time should be removed from the room, and no linen which has been worn by the patient should be used by any other person. 2. All articles used by the patient, and capable of being washed, should be placed without shaking or brushing in the solution of soap already mentioned, which should be situated in the patient's bedroom. 3. All bandages and dressings should be burned and the instruments disinfected with carbolic acid. 4. Except in special cases, indicated further on, all excretions from the patient should be received in vessels containing constantly the lye-soap solution, and thrown as soon as possible into the water-closet. If the pôts de chambre become soiled they should be scoured with the lye-soap solution. 5. Bad odours should be treated by good ventilation, and not by fumigations and deodorizers, or else by taking pains to prevent them altogether. 6. No food should be kept or prepared, nor should any one eat or drink, in the sick-room. On leaving the room, the attendants should wash themselves thoroughly, scour the beard, and brush the clothes with carbolic-acid solution.

(*b*) *Rules for Transporting the Patient and his Clothing.*—1. When it is necessary to carry the patient to a hospital, on account of variola, cholera, or typhus fever, it must be done through the sanitary police. Public carriages shall not be used for this purpose. When a case is made known, disinfecting measures must be resorted to at once. Before the removal, the patient and his clothing should be disinfected by means of the carbolic acid spray. 2. After recovery, the patient should be placed in a bath, and, if possible, thoroughly washed with lye-soap solution; then with a large quantity of tepid water, and clothed. The clothing which has remained in the chamber during the period of sickness should be exposed to chlorine gas before they are again worn, and the room should be thoroughly disinfected. 3. The bodies of persons dead of a contagious disease must be removed as soon as possible; where the patient has died of variola,

diphtheria, typhus fever, or cholera, he should be wrapped in cloths impregnated and wet with a solution of corrosive sublimate, 1-1500. For other diseases, the shroud should be wetted with the lye-soap solution. If a cadaver remains for more than twenty-four hours in the house, the abdomen should be covered with a piece of cloth impregnated with chloride of lime, 1-5, in order to prevent any disagreeable odour.

(*c*) *Rules regarding the Clothing, etc., surrounding the Patient.*—1. Before sending to the laundry the clothing, bed-linen, and articles which can be washed, they should be wrapped, without shaking or brushing, in cloths impregnated with a solution of corrosive sublimate, and boiled for half an hour in the lye-soap solution, if death was caused by variola, diphtheria, cholera, typhus fever, charbon, glanders, or hydrophobia. When death has been caused by other diseases, it is sufficient to wrap the articles in cloths soaked in the lye-soap solution, and then to wash them in hot water as soon as possible.

2. Articles which cannot be washed, such as the beds, pillows, mattresses, bed-coverings, draperies, and carpets, must be covered with cloths impregnated with corrosive sublimate, after cases of any of the above-mentioned diseases, and disinfected by dry heat or steam. Mattresses and pillows must be opened, in order that their contents may be purified; if of but little value, they must be burned. After other diseases, it is sufficient to wrap these articles in cloths soaked in the soap solution, and then expose them to dry heat. Leather articles should be treated successively with the soap solution and carbolic acid. Detritus and remains of all kinds should be burned.

(*d*) *Disinfection of Evacuated Apartments.*—1. In variola always, and in scarlatina and varioloid when the police order, the floors, walls, windows, doors, furniture, and utensils of all kinds must be scoured with sponges or brushes wet with corrosive sublimate solution, and immediately afterward everything must be washed with the soap solution. After other diseases the black-soap solution may be used instead of corrosive sublimate. It is sufficient to rub decorated walls with a wet sponge.

2. After each object has been treated in the above-described manner, chlorine gas should be disengaged in the room—vessels containing the mixture from which this gas is disengaged should be placed on some high object on account of the density of the gas. During this process the doors and windows should be tightly closed. Metallic objects should be protected from the action of the chlorine by a coating of oil or varnish. The apartment should remain closed for twelve hours, after which cloths wet with ammonia should be hung in the room, in order to neutralize the chlorine gas which does not pass out when the windows are opened.

(*e*) *Special Directions.*—1. Variola is especially transmitted by the secretions from the skin of the patient, and as much by the linen and clothes as by the emanations which the attendants respire. All the rules for disinfection should, therefore, be exactly carried out.

2. Diphtheria is generally transmitted by the sputa of the patient, received on handkerchiefs, or falling on the bedclothes or directly on the attendants. Special attention should, therefore, be paid to this mode of transmission of the disease, and to the rules laid down for these cases. The urine should be received into vessels containing carbolic acid solution.

3. The manner in which cholera is conveyed is not certainly known. It is quite certain, however, that in certain cases the disease is conveyed by the intestinal discharges. Rooms occupied by cholera patients should be thoroughly ventilated and subjected, for several days, to carbolic-acid vapours. Especial care should be taken that no one eats or drinks in the room, and that no food is placed

therein. The directions for disinfecting articles of clothing, etc., have already been given. The evacuations should be received into vessels half filled with a solution of corrosive sublimate solution. Cholera patients should not use water-closets; but, if this has been done, the closet should be thoroughly disinfected, and the seat thoroughly washed with a strong disinfecting solution.

4. Both typhoid and typhus fever may be transmitted from the patient to the attendants. In typhus fever very free ventilation is necessary, and sprays should be used several times a day. The stools should be received into vessels half filled with carbolic-acid solution. Typhic patients should not be permitted to use water-closets; when they do use them the closets should be disinfected.

5. Scarlatina is but little contagious to adults and children who have already had the disease. It is, on the contrary, dangerous for pregnant women. The urine should be received in a vessel half filled with carbolic-acid solution.

6. Measles is very contagious for children, less for adults. Ventilation is very important; when not practicable, the spray should be used.

7. As stated above, precautions must be used with the linen soiled by dysenteric patients; their stools should be received in carbolic-acid solution as already described. The patients should not be allowed to use the water-closets; if they do, however, the closets should be disinfected as above.

8. The virus of charbon and glanders from man is not so virulent as that from animals; nevertheless, special attention should be paid to the dressings and instruments. There are no special indications for hydrophobia.

9. Objects contaminated by the sputa of persons sick of pertussis, tuberculosis, or other contagious inflammations of the lungs, should be disinfected with particular care; if it is difficult to obtain good ventilation, the carbolic spray should be used. In cases of contagious ophthalmia, all bandages, compresses, handkerchiefs, sponges, etc. should be carefully disinfected.

10. Rules for disinfection of lying-in women, and those attacked by or attendant on puerperal fever, may be gathered from the foregoing.

11. Patients suffering with wound diseases should be isolated as much as possible. The dressings should be burned when they are of no value. Instruments and utensils used should be placed in a 1 to 30 carbolic-acid solution, and the dressers should wash their hands with soap and carbolic-acid water after attending to the case.—*Union Méd. du Nord-Est*, October 15, 1883.

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## MEDICAL JURISPRUDENCE AND TOXICOLOGY.

### *Ptomaines, or Cadaveric Alkaloids.*

Mr. R. N. Wolfenden gives the following *résumé* of the facts concerning the ptomaines:—

Though the term "ptomaine" was first applied by Selmi to these bodies to indicate that they were of cadaveric origin, their distribution is no longer to be limited to the cadaver, but investigations are rendering it more and more probable that alkaloids of a poisonous nature occur in certain pathological conditions, and possibly also normally, as a product of change of living tissue. Selmi's first observations were made on corpses dead of arsenical poisoning, and it is of interest to refer to his methods. The liquid under observation was made alkaline with baryta water, and then extracted with ether; acicular crystals were produced, which precipitated the principal reagents that alkaloids answer to, with

the exception of platinum chloride. Selmi's second attempt was made by extracting the liquid with aqueous alcohol, then making alkaline with baryta, shaking with ether, ridding of the ether by spontaneous evaporation and distillation, treating the turbid liquid thus left by water acidulated with acetic acid, filtering and evaporating to dryness; then taking up the residue with water, again rendering alkaline with baryta and extracting with ether, and repeating the process till the liquid became colourless. The alkaloid thus extracted was so strongly poisonous as to destroy frogs with the greatest rapidity. Both of these extracts were free from arsenic. Subsequently Selmi extracted from the stomach of a hog which had been kept on arsenious acid a compound of an alkaloid (ptomaine) and arsenic, of an intensely poisonous nature, and resembling very much the vegetal alkaloid strychnia. As to their manner of production, Selmi supposed them to be products of putrefaction of organized nitrogenous material. They are variable in their nature according to the length of time after death, and though not present within a few hours after death in any appreciable quantity, they slowly develop with advancing decomposition. Indeed, it is only with extreme difficulty that in medico-legal cases they can be distinguished from true vegetal alkaloids, if the post-mortem examination be delayed; but probably, if made within twenty-four to forty-eight hours after death, any alkaloid found then will be a vegetal and not a cadaveric one. In general these ptomaines are oftenest amorphous in form and alkaline in reaction. They are for the most part volatile and easily alterable. They form crystalline salts with acids as a rule. The addition of acids to them usually changes them, with the production of pleasant odours, like orange-flower, musk, etc. Allowed to oxidize by contact with atmospheric air, they emit disagreeable cadaveric or urinous odours.

Some of these ptomaines are not poisonous, but most possess strongly toxic characters, and cause profound symptoms when injected under the skin—such as paralysis, more or less complete, of hinder extremities, dilatation of pupils, convulsions, muscular flaccidity, slowing or acceleration of the heart, loss of cutaneous sensibility and of muscular contractility, possessing many of the characteristic physiological actions of muscarin or atropin. They answer to nearly the same reactions as the vegetal alkaloids, some being precipitated by platinic chloride, gold chloride, mercuric chloride, or tannic acid, etc.; and all have a strongly reducing action on potash ferridcyanide. They yield colour reactions with sulphuric acid (red), iodic acid and sulphuric acid (violet), nitric acid (yellow), etc. Their physiological properties are really their only characteristic properties, distinguishing them from other alkaloids. These ptomaines are met with under the following conditions:—

1. *As a Constituent of Normal Tissues or Juices* —In this case they are products of tissue metamorphosis (*a*) If from twenty to thirty cubic centimeters of fresh saliva be taken and evaporated over a water-bath to dryness, and the residue extracted with boiling water and finally filtered, a toxic substance is obtained, which is strongly reducing, and converts ferridcyanide of potash, along with one or two drops of ferrichloride, into "Prussian blue." Injected into the thigh of a frog with a Pravaz syringe, it kills the animal in a longer or shorter time. (*b*) Snake poison differs from human saliva only in the intensity of its action. Gautier has extracted from the poison of trigonocephalus and naja two distinct alkaloids, and a third which resembles either an alkaloid or an albuminous compound. (*c*) From normal urine Gautier asserts to have obtained a fixed oxidizable alkaloid, which forms a crystalline chloride, and also a crystalline double salt with platinic and gold chloride. This alkaloid is very poisonous, killing quickly with systolic standstill of the heart, stupor, and paralysis. Though

Gautier's facts are unquestionable, there is a fallacy underlying his explanation of them that renders it valueless.

2. *In certain pathological conditions*, recent observations of Selmi's on what he calls pathological basis would seem to show: (*a*) In the urines of patients suffering from progressive paralysis there are two volatile bases: the one like nicotin, the other like coniin. (*b*) In the urine voided during a case of interstitial pneumonia were two alkaloidal bases: one having the odour of stinking fish, the other of ammonia. (*c*) Two similar bases were found in the urine of patients with abdominal typhus. (*d*) In tetanus a base like coniin was discovered in the urine. (*e*) In the urine of "miliary fever" an alkaloidal base having the odour of stinking fish has been observed.

3. *As a Cadaveric or Artificial Production.*—There can be no further doubt that these bodies are largely produced in the process of decomposition of nitrogenous or proteid tissues. Since Selmi first described their production his facts have been abundantly confirmed and extended. There are many varieties of them, and they vary much in their nature, according as the length of time after death is long or short. They are, however, of slow production naturally, a point referred to before, and to be borne in mind in conducting medico-legal inquiries. Stinking fish, bad meat, etc., all contain poisonous principles which can be extracted after the manner of ptomaines. The gastro-intestinal irritation and profound toxic symptoms produced by the ingestion of bad food are probably at the bottom processes of alkaloidal poisoning. On this subject I shall have more to say on another occasion. It is even possible that many so-called uræmic phenomena are produced by the retention within the body of these alkaloidal poisons; and, further, that the products of gastric digestion contain poisonous properties which, imperfectly excreted, may become toxic. There is a statement by Balduino Bocci that normal urine, especially after meal times, if injected into frogs, destroys them rapidly. The observation of Gautier that an alkaloid of highly poisonous nature is to be obtained from normal human urine is of importance with reference to this point.

Brieger has obtained by the decomposition of neurin final products of trimethylamine, and a volatile body giving the iodoform reaction, which he suggests may be identical with those volatile substances in urine which give the iodoform reaction. By decomposition of neurin and albumen toxic bodies may be obtained much resembling muscarin. Both from freshly prepared peptone made by the action of gastric juice on pure fibrin, and from stinking peptone by boiling with caustic soda, evaporating, extracting, and purifying, toxic alkaloids can be obtained which kill frogs and rabbits in a few minutes. Putrefying casein, brain substance, liver, and muscle also yield these products. In the laboratory I have confirmed the observations of others as to the production of these substances, and I have also confirmed the statement of Gautier as to the production of a toxic principle from ordinary fresh saliva, which are very destructive to small animals. The extension of these observations to the investigation of snake poison and the salivary poisons of certain animals in the pathological state (rabies, etc.) becomes of extreme import. The investigations of Weir Mitchell on the production of snake poison are of extreme interest in connection with this point, indicating, as they do, the discovery of three toxic principles in serpent's venom: the one resembling a peptone, the other a globulin, and the third serum albumen.

Some of these ptomaines are poisonous, some non-poisonous; and it is common to find a poisonous and a non-poisonous moiety linked together. Some are volatile and crystalline, others non-volatile and non-crystalline, some precipitated by ether from acid or alkaline solutions, and some only precipitated by amyl, alcohol, or chloroform. With regard to tests, they answer to many of those

usually employed for vegetal alkaloids, giving a dark colour with tannin, a thick yellow precipitate with potash cadmium iodide or potasso-mercuric iodide, with cadmium or bismuth iodide a red precipitate, with gold a mercuric chloride, a precipitate, and some of them precipitating platinic chloride. The vast majority are strongly reducing. This fact was put forward by Brouardel and Boutmy as a distinctive test for the presence of ptomaines. The base extracted from the body is converted into a sulphate, and to a little put into a watch-glass which contains ferridcyanide of potash a few drops of ferric chloride are added. If a ptomaine be present there is a reduction of the ferridcyanide and the formation of Prussian blue. Brouardel and Boutmy asserted this reaction to be given only by ptomaines, morphia, and perhaps veratria, and to be in a manner characteristic. It has since been proved by Tauret, Gautier, and others that many vegetal alkaloids yield this test (aconite, digitaline, ergotinine, hyoscyamine, etc.), and also many artificial alkaloids (aniline, methylaniline, phenylamine, collidine, etc.). Even gelatine solutions and solutions of extract of meat give this Prussian blue reaction, so that it cannot for an instant be taken as characteristic of the ptomaines. No chemical test has as yet been devised that is at all crucial, and the general reactions, taken along with their physiological peculiarities alone, can be taken as evidence of the presence of a ptomaine.

The ptomaines so far described are: 1. Ptomaines, like atropin and hyoscyamine (Sonnenschein and Quelzer), crystalline, and which dilate the pupil and accelerate the heart. They are obtained from putrescent albuminous fluids. 2. An alkaloid from decomposing yeast (Schmiedeberg and Bergmann), which the authors call sepsin, and which resembles strychnia. 3. An alkaloid resembling morphia in its tests, but not in its physiological properties (Selmi). 4. One agreeing with delphinin, and which by warming with phosphoric acid gives a red colour. It does not agree physiologically. 5. One resembling strychnia in its behaviour towards sulphuric acid and potash bichromate, but not causing tetanus (Ciotto). 6. Alkaloids like muscarin (Gautier, Brieger, etc.). 7. Alkaloids like coniin, colourless, leaving a sharp taste like tobacco, and consisting of a poisonous and non-poisonous moiety, one part volatile the other non-volatile; one soluble and precipitated by warmth, like coniin, the other not. 8. Alkaloids resembling parvolin and hydrocollidin (Gautier and Stard), and one like collodin (Neucki).

As to the manner of production of these bodies chemically, I do not propose here to enter. It could only at present be speculative. I would sum up briefly as follows:—

1. There are developed in the body, post-mortem, poisons of an alkaloidal character, and which can be obtained also by decomposition of albumen, peptone, casein, muscle, brain, etc. Moreover, they seem to be present in some normal secretions (saliva and urine).

2. These cadaveric alkaloids may be mistaken, post-mortem, for vegetal poisons administered with evil intent; but if the body be examined within from twenty-four to forty-eight hours after death, any alkaloid there found would be strong presumptive evidence of poison, and not ptomaine. After a couple of days it may be a matter of doubt.

3. There is no satisfactory test surely indicating the presence of a ptomaine. Physiological characters must be taken in conjunction with chemical tests.

4. Probably the production of ptomaines within the living body may be the pathological cause of many obscure conditions, especially those following on poisoning by bad food, such as stale fish, etc.—*Lancet*, Nov. 17, 1883.

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